PROGRESS REPORT

OF

FOREST ADMINISTRATION

IN THE

PUNJAB

FOR

1878-79,

By B. H. BADEN-POWELL, Esquire, B.C.S.,

CONSERVATOR OF FORESTS.

WITH A REVIEW BY THE LIEUTENANT-GOVERNOR

AND

ORDERS BY THE GOVERNMENT OF INDIA.

1880.

CALCUTTA:

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No. 917 F., dated Simla, the 12th November 1879.

From—C. Bernard, Esq., c.s.i., Officiating Secretary to the Government of India, Home, and Revenue Agricultural Department.

To—The Secretary to the Government of the Punjab.

I am directed to acknowledge the receipt of a Resolution by the Government of the Punjab, No. 383F., dated the 3rd ultimo, on the Report of Forest Administration in the Punjab for 1878-79, and to communicate the following observations by His Excellency the Governor General in Council.

2. In the Report for 1877-78, the area of forest under the control of Government for purposes of forest conservancy on the 31st March 1878 was stated as 3,791 square miles. The return appended to the present Report comprises those forests only which have been legally declared Reserved Forests, and if the figures of the statement are correctly understood, the different areas entered in this return were declared Reserved Forests under the following enactments:—

	Square miles.	Acres
I.—Under the Hazara Forest Regulation of 1879 ...	236	150,642
II.—Under the Rules forming part of the lease of the forests in the Chamba State of 1872	219	140,445
III.—Under the Rules forming part of the lease of the forests in the Bashahr State of 1877	38	24,600
IV.—Under the Indian Forest Act	298	191,313
Total ...	791	507,000

3. Regarding the measures that should be taken to enable Government legally to demarcate and to settle the remaining area previously included under Reserved Forests, it is said that the principal cause of delay has been the weakness of the staff available for the settlement and demarcation of forests, and in his review the Hon'ble the Lieutenant-Governor urges the necessity of employing an establishment sufficient to perform this work.

4. On other occasions also communications have been received from the Punjab Government, urging with strong arguments the necessity of a considerable increase to the superior Forest Staff. It has lately been possible, by a re-distribution of appointments, to raise the number of Deputy and Assistant Conservators sanctioned for the Punjab Forests from 14 to 17 as a temporary measure, and to fix the number of Sub-Assistant Conservators at 4. Existing circumstances will, however, make it impossible to sanction any further increase of the superior Forest Staff in the Punjab. The Conservator of Forests justly represents the necessity of having a larger proportion of professionally-trained Forest Officers at his disposal for this and other work; but ever since 1876 the number of such officers sent out from home has been so small that it has not been possible to spare any of them for the Punjab. It is under consideration to address the Secretary of State for an increase in the number of professionally-trained officers to be sent out from England.

5. The statement made in paragraphs 10 and 26 of the Conservator's Report, regarding the appropriation of land and the clearance of forest, apparently without his consent, in the Dungagali Reserve in Hazara, and the statement made in paragraph 95 regarding the road cut without authority to a new military camp through the forest, have been noticed, and I am directed to ask whether some action is not required, in order to define the limits beyond which land should not be appropriated in this reserve for other than forest purposes.

6. Destructive forest fires are reported to have occurred in Hazara, Rawal Pindi, Kulu, and at Kalesar. Fires being the exception in the Punjab forests, and not the rule fortunately, no return of forests specially protected from fire is appended to the annual report, as is customary in other provinces. But of late years destructive forest fires have frequently been reported, and it will in future be necessary to record in the annual reports a detailed statement of all areas burnt over during the year.

From paragraph 38 it is gathered that the protection of the Rawal Pindi forests during the year was extremely unsatisfactory, in spite of the efforts of the Divisional Officer. If the Conservator's statement is correct, this is not as it ought to be, and some action would seem to be needed to remedy this state of things.

7. Good progress is reported to have been made in the operations undertaken for the improvement of the Pabbi Rakh in the Gujrat district. From paragraph 50 of the Report it is gathered that a total area of 3,050 acres has now been successfully operated upon at an aggregate outlay of only Rs. 4,404; this is satisfactory.

8. The area of the separate plantations, and the outlay incurred upon them, are recorded as follows:—

	Area in acres.	Outlay Rs.
On the 1st April 1878	15,420	7,00,255
Additions	1,683	69,461
On the 31st March 1879	17,103	7,69,716

According to the data entered in statement 53, extensive thinnings in Changa Manga and in the Sailaba plantations near Lahore were made during the year, yielding 686,343 cubic feet of stacked wood, in addition to 202,959 cubic feet on hand from last year. Of this quantity, only 231,084 cubic feet were sold, leaving 658,218 cubic feet on hand. It is understood that the Conservator does not apprehend any difficulty in disposing of these large quantities of wood. It may be for consideration whether the extreme scarcity of fuel required for the Military Department at Jhelum and Rawalpindi, as recently reported by the Commissary General, may not be supplied in part from this source.

According to paragraph 130, the revenue realized from the Changa Manga and other plantations was Rs. 14,100, which is more than the revenue realized in previous years.

9. An important statement is given in paragraph 97 of the trees cut during the ten years from 1869 to 1878 in the forests leased from the Chamba State on the Chenab and Ravi rivers, of which the following is a summary:—

	Chenab.	Ravi.	Total.
Deodar, green...	1,773	1,155	2,928
Ditto, dead, and windfall trees	4,862	389	5,251
Pinus excelsa	991	830	1,821
Total ...	7,626	2,374	10,000

The small quantity of green timber cut in these forests during this period is satisfactory, considering that the working of these forests has at least covered

its expenses during the corresponding period. The following figures are extracted from the annual reports of the last ten years :—

Chenab and Ravi Divisions.

	Receipts.	Charges.	Surplus.
	Rs.	Rs.	Rs.
1869-70	1,38,721	2,91,590	Deficit 1,52,869
1870-71	5,42,267	6,90,598	Deficit 1,48,331
1871-72	3,11,952	2,60,652	51,300
1872-73	1,35,143	1,63,350	Deficit 28,207
1873-74	2,50,952	1,52,222	98,730
1874-75	1,62,758	1,36,484	26,274
1875-76	1,90,506	1,28,039	62,467
1876-77	1,15,406	1,19,467	Deficit 4,061
1877-78	1,40,619	98,688	41,931
1878-79	1,75,960	1,21,657	54,303
Total ...	21,64,284	21,62,747	1,537

10. The charges include the annual payments made to the Chamba State for the lease of the forests. The revenue of this period has been chiefly realized from timber brought down on Government account. It may be suggested to the Conservator to enter in the Report for the current year a record of the quantity of timber brought from these and other hill forests and made available for the market during the same period.

11. Demarcation in these forests is reported to have made good progress. If the figures of the Report are correctly understood, an area, chiefly of forest producing deodar, or capable of producing this timber, aggregating 140,445 acres, has already been demarcated under the provisions of the lease, to be permanently maintained as forest, and further extensions are expected to be made. The Conservator, it is understood, contemplates that in a year or two demarcation may be so far completed as to justify the commencement of cuttings. In paragraph 123 of his report Mr. Baden-Powell states that the officers now in charge of the Chamba forests, though excellent officers, would not be able to make a preliminary plan of working the forests in their present state, and that therefore fellings must wait until the services of professionally-trained officers can be obtained to frame the needful plan of operations. This is to be regretted; but it is presumed that the forests will not deteriorate, but will rather improve by a further suspension of cuttings, and although, until fellings can be resumed, the revenue will be less, yet the general policy pursued by the Conservator in this respect appears to the Governor General in Council to have been prudent and judicious.

12. The financial results have been as follows :—

		Rs.
Receipts		4,76,575
Charges { A—"Conservancy and works"		2,58,952
Charges { B—"Establishments"		2,64,602
	Total ...	5,23,554
	Deficit ...	46,979

The explanation given by the Local Government and by the Conservator, that the deficit was fully covered by the stock in hand undisposed of at the close of the year, is accepted.

13. Of the statements, forms 57 and 58 should be omitted in future reports, as prescribed in the Circular Resolution of the Department of Revenue, Agriculture, and Commerce, No. 10F., dated the 23rd January 1878.

14. The Report is clear and short, and the Governor General in Council readily endorses the high commendation bestowed by His Honour upon Mr. Baden-Powell for the energy and ability with which he has devoted himself to his work.

No. 918F.

COPY of the above, with a copy of the Report, forwarded to the Military Department for information, with reference to paragraph 5.

Govt. Central Branch Press, Simla,—No. 679, H. E. & A. D.—14-11-79—956.

Proceedings of the Hon'ble the Lieutenant-Governor of the Punjab, in the Department of Revenue, Agriculture and Commerce (Forests),—No. 383F., dated 3rd October 1879

READ—

The Forest Report of the Punjab for 1878-79.

RESOLUTION.—The report is a brief and clear one. The year was signalised by the passing of a new Forest Conservancy Act, but from a variety of circumstances it was found impossible to carry out any systematic measures under its provisions until towards the close of the year, by which time about 336 square miles of land had been declared Reserved Forest under the Act. This, however, does not represent the whole area subject to strict forest conservancy in the Province; 173 square miles of reserve in Hazara are under a special regulation, and the provisions of the Act do not affect other important forests such as those in the Ravi and Chenab Divisions which are held on lease from a Native State, and a large tract in the Sutlej Division worked under the Bashahr Lease Rules. In the plains of the Punjab, waste land is generally subject to private rights, and unusual difficulties consequently attend the work of conservancy under the new Act; but the principal cause of delay in the settlement and demarcation of forests has been the weakness of the staff of officers available for the purpose. The Hon'ble the Lieutenant-Governor has more than once noticed the importance of strengthening the staff of the Department, and desires again to record his opinion of the necessity of employing an establishment sufficient to perform the work of demarcation of lands which can be constituted Reserved Forest; for the cause by which this has hitherto been retarded must continue to operate until an adequate remedy is applied. If it is urged that the receipts from forests are too small to justify an increase of establishment, the answer is that the rights of Government are wasting away under gradual encroachment, and it will be impossible hereafter to meet the increased demand for fuel due to the extension of railways unless measures are taken to acquire lands which are needed, and can be secured by timely action.

2. The settlement of the Murree and Kahuta Reserves awaits the completion of the survey map, which it is hoped will be in the hands of the Forest Officer during the coming cold weather; as soon as his enquiries are sufficiently advanced, a Civil Settlement Officer will be deputed to take up and finish the work. The modified proposals of the Conservator of Forests for working the Gujranwala Rakhs have been approved by the Lieutenant-Governor, and sanction has been given to the steps necessary to carry them out. Certain blocks to constitute a 'Fuel Reserve' will be closed entirely to camels and goats, and some by rotation to all cattle; others, grouped together as a grazing reserve, will afford the requisite pasture for neighbouring villages. A large supply of fuel for the Punjab Northern State Railway may after a few years be confidently expected from these rakhs.

3. The attention of the District Officers of Hazara and Rawalpindi has been drawn to the necessity of enforcing a stricter observance of the rules of forest conservancy, in order that, while due attention is paid to private rights and privileges, the legitimate claims of Government and the future interests of the State in general may not be disregarded.

4. The receipts of the year were Rs. 4,76,575, a little over two lakhs less than in 1877-78. The expenditure was Rs. 5,23,554, but the deficit Rs. 46,979 is fully covered by the stock in hand undisposed of at the close of the year.

5. The experiments recorded in the report do not call for special notice Seeds of the Eucalyptus were supplied for trial in Kangra, Hoshiarpur and Dera Ismail Khan, but the result was disappointing in the two districts last named. When seed is distributed to district officers for experimental cultivation they should be furnished at the same time with instructions on the season for sowing and the treatment of the young plant.

6. In conclusion, the Hon'ble the Lieutenant-Governor desires to express his sense of the energy and ability with which the work of the Department is superintended by Mr. Baden Powell.

ORDER.—Ordered that this review be printed and published in the *Punjab Government Gazette*; also that copies be furnished to the Secretary to the Government of India, Home, Revenue and Agricultural Department, the Conservator of Forests, and the Financial Commissioner.

By order of the Hon'ble the Lieutenant-Governor, Punjab,

LEPEL GRIFFIN,

Secretary to Government, Punjab.

Printed at the Punjab Government Civil Secretariat Press, Lahore.—10-10-79.—400.

FOREST ADMINISTRATION REPORT, 1878-79.

CHAPTER I.

GENERAL SUMMARY.

1. This report will be brief, partly for the sake of economy in printing, partly because of the time taken by printing a long report.

2. The event of the year has been the passing of the Forest Act VII., 1878.

The new Forest Act VII. of 1878.

Under its provisions a new set of rules for managing river-transport has been submitted. It is too early to speak of the effects of the complicated provisions in Chapters 2 to 4, but it is a significant fact that the first settlement attempted in the Punjab under Chapter 2 has broken down. The Settlement Officer appointed for the Salt Range forests has declared the impossibility of recording rights and otherwise of acting under Chapter II. The consequence is that these forests will be made "protected," although there is no doubt about the fact that the area is wanted *permanently* as forest, and that therefore the provisions about "protected" forests will be singularly inefficient.

3. It has been the subject of remark that so little forest was declared as already reserved under Section 34 of the new Act. It should be remembered, however, that the declaration under that section is so clogged with conditions that it would have been unwise in the extreme to have declared any forest reserve that was not certainly either free of rights, or capable of being made so at once.

Forests declared under Section 34.

4. The condition of the Punjab is very different from that of other Provinces. I do not under-rate the skill with which large areas of forest, in Bengal for instance, have been selected, or the labor involved in exploring the tangled jungles of the "terai," but that labor once over, no questions of popular rights arose to render it difficult to declare large areas "reserved."

Conditions under which reserves can be obtained in the Punjab.

5. In the Punjab I am using no exaggerated language when I say that every acre of reserve actually declared has been won after a lengthy and often laborious correspondence.

6. We have not in the Punjab anywhere (except in the "bár" and a few other remote places) any large excess of forest; consequently *all* measures of conservancy interfere with some one. The *demarcation and settlement* of our remaining forests, so as to make it clear that the forest must be always kept with a portion under closure (for reproduction), is consequently the present most urgent necessity of this Province.

Forest nowhere exists in excess, hence every attempt to conserve any manageable area raises opposition.

Demarcation and settlement are the foremost needs.

7. During the year under report to enable this important work to be carried out, the staff has been kept so low that the ordinary work of River and Forest Divisions could hardly be kept in hand. Only two trained officers out of the whole staff were allotted to the Punjab, and no Assistant was allowed to the Conservator's office.

Means available.

8. If a staff sufficient in number and training be not temporarily attached so as to do the demarcation and settlement of the forests in the Punjab, the permanent ruin of the forests and the progressive diminution of forest revenue may be confidently looked for in the next few years.

A staff adequate in number and training, temporarily attached, is needed.

N. B.—(Divisions about which no fact of importance has to be recorded in the sequel are simply omitted).

Jhelum Division.

9. The preliminary work necessary to preparing a working plan for the Dungágali reserves was so far completed that the officer in charge could, at the close of the season, be removed to another sphere of work.

Dungágali forest working plan.

Work completed.

10. The complication about the limits of the Civil and Military status in the reserve continues. Every year pieces of land are appropriated, and often the Imperial revenue also, without any authority. I referred this matter with maps to the Financial Commissioner in 1876.

Various new stations inside the forest.

Rawalpindi.

11. A few reserves in the plains (*vide* Table 45) were gazetted; these have been settled. The settlement in Murree and Kahuta is again deferred, the survey work being not near enough completion to enable demarcation work to begin.

Forest settlement still delayed by incomplete survey.

Ravi.

12. A large portion of the Sufl forests has now been demarcated, and (just at the close of the year) the work accepted by the Superintendent.

Demarcation of eight blocks on Sufl (Chamba) complete.

The Shahpur kandi forests have been demarcated in a preliminary way, and a report with proposals for settling the whole has been submitted.

Shahpur Kandi Chil and fuel forests.

Beas.

13. During the whole year the Kulu demarcation remained without orders. I have repeatedly brought this important matter forward, I regret not to be able to do more.

Urgent need for orders as to the Kulu forests.

14. The reserves in Hoshiárpur and in Núrpur and Dera Tahsíls of Kángra were declared reserved, because these were really out of dispute owing to the settlement made by Mr. Duff and Mr. Roe.

Reason for gazetting reserves only in Núrpur and Dera.

15. The Kángra Tahsíl has been reported on by Colonel Stenhouse, and as soon as a Forest Settlement Officer can be spared, this Tahsíl may be settled; the work will be one of great difficulty.

Report on the Kángra Tahsíl received.

Demarcation awaits an available officer.

16. It was unwise to declare as reserves the old Government "tihái" in the Hamírpur Tahsíl; the whole requires redemarcation.

Old reserves in Hamírpur not maintained.

Sutlej.

17. So far the new lease has worked smoothly. Demarcation of forest here has to be very gradual. All forest in Basahir should, however, be kept as forest; portions that are really wanted (and can be properly given up) as cultivation spreads will be given up, and demarcation in *that* way be gradually accomplished without creating any ill feeling.

New lease of Basahir (1877).

Demarcation here must proceed in a special manner.

18. Preparations were made for taking up timber work in 1879-80 on this river, it being its turn. The Jhelum works are closed with the year under report.

This river will be worked next (under its own working plan).

Fuel Reserve, North.

19. The great Pabbi range is declared a reserve, but it is not all free of rights. This is of little consequence, as it is large enough to enforce strict closure of portions that require it.

Pabbi reserve (Gujrát District), 38 square miles.

The "belas" or islands, either detached or semi-detached from the river-banks (on the Chenab), were declared reserves when planted or about to be so in the immediate vicinity of the Railway. I saw no use in declaring as forests islands far down the river.

Islands near Railway gazetted as reserves and planted.

I did not get the Phálián rakhs of Gujrát reserved, nor those in Bhera of Shahpur, because all rights and *conveniences* which in the Punjab are so much more troublesome than rights require to be settled under the Act. The Salt Range I have alluded to before.

Phália rakhs of Gujrát and Bhera of Shahpur require settlement before gazetting.

Fuel Reserve, South.

20. During the year, this Division was re-organized; the Lahore rakhs and one or two plots in Amritsar were handed over to Plantation; the Gujránwála rakhs to Chenab; and the Fuel Reserve has now become the "Fuel Reserve, South," conterminous (except for the few rakhs in Dera Gházi Khan) with the Mooltan Civil Division.

Re-organization of Division.

21. We have completed a good set of reserves for North Mooltan (Sarai Sidhu) along the line; some 33,000 acres. The proposed reserves on the Indus Valley Line (Lodhrán), and some which will not be profitable for some years to come in Mailsi, are now nearly ready for settlement. As we know them to be free of rights, the settlement will be only a matter of time and form.

North Mooltan reserves accomplished.

22. In Montgomery a large map and a series of reserves was sent up during the year; after much correspondence and interviewing, a general objection was still kept up. I therefore carefully inspected the whole during the winter with Mr. Shakespear, and we are now nearly ready to send up a revised scheme.

Montgomery reserves' first proposal has been opposed.

A new map and scheme prepared, and nearly ready for submission.

23. The available rakhs in Muzaffargarh and Dera Gházi Khan have turned out of so little value, and so scattered and difficult to inspect, that I do not know as yet what to decide about them.

Muzaffargarh and Dera Ghási Khan reserves.

CHAPTER II.

AREA AND BOUNDARIES OF RESERVED FORESTS.

Explanation of Form 45.

24. It is necessary to explain Form 45. Two ways were possible: either to show all that were in last return in the opening column, and then to show as excluded all that were not reserves under the Act at the close of the year; the other to treat the old list as a thing of the past (except so far as relates to forests in Jhelum, Ravi, Chenab and Sutlej not affected by the Act), and show the new reserves in the "added column." The second course was necessary, because the first would have caused an enormous waste in figure printing, and because the new reserves being gazetted under different names from the old, the nomenclature would not have allowed it.

Kángra reserves shown in totals, because details are too lengthy.

I have given the total of the forests in Núrpur and Dera, though the Gazette contains several pages of names of the separate blocks. In fact, we have gazetted each compartment almost separately, and it would have made Form 45 too long to repeat this.

Nothing now in the form which is not *legally* reserved.

Nothing is shown in Form 45 which is not *legally* a reserve under full control, either of the Act, the Hazára regulation or the forest leases.

Jhelum.

Annexation of part of Pira Ghaib island.

25. A large piece of the Píra Ghaib island plantation has again been annexed by the Military Department. I have assented, however, at the Financial Commissioner's request, on the promise he was good enough to record, that *no further diminution of our area would be allowed.* The area has now been clearly demarcated, and an officially attested map besides our own plantation map asked for to prevent disputes.

Permanent pillars for the Hazára reserve.

26. In the Hazára reserved forests Mr. Sparling commenced putting permanent pillars up in Nos. 1 and 21 forests of the Kághán Range, and finished 169 pillars. I have transferred the work to Dungágali as more important, for the outer boundaries will not be affected by the nine stations inside the boundaries. I beg again to call attention to the fact that wherever these stations go, their first step is to cut down the trees, and that it is really important for the hills all round (and the stream-courses below) that these stations should be settled.

Mischief done by the establishment of these stations.

Remained unnoticed for three years.

This is the third year that this matter has remained without notice.

Rawalpindi Division.

Transfer of fuel forests to this Division.

27. During the year the Khánpur rakhs were transferred to this Division (31,786 acres), as their market is towards Ráwalpindi.

Disputes about the position of boundary lines of reserves.

28. There are still many disputes about the position of the pillars in the plains reserves, as declared in the Gazette. Every effort has been made to get them settled but to no purpose. In one case (Kheri-már) the villagers have destroyed many of the pillars; no action has been taken, though the matter was reported clearly in February last.

Fuel Reserve Division, North.

29. Demarcation by trenches has been carried on in the Phália (Gujrát) rakhs, also in the Bhera Tahsíl, Shahpur, but many portions of the boundary are disputed. Seventy-two miles of boundary have been demarcated where there was no dispute. These rakhs will now be sent up for settlement under the Act.

Demarcation of rakhs by trenches.

Chenab.

30. Mr. Wild's working plan for the Gujránwála rakhs has been completed, and some of the blocks have been demarcated by trenches. The Deputy Commissioner has raised objections to the plan as usual (the rakhs are the absolute property of Government, not a vestige of a *right* in them). This I mention merely as showing how little the question of legal *rights* has to do with the settlement of any forest in the Punjab. I have submitted the whole for the decision of higher authority with a modified proposal. If *this* cannot be agreed to, the whole time and expense spent over the working plan will have been absolutely wasted.

Working plan for Gujránwála rakhs.

Mentioned as showing that it is not the question of legal *rights* that causes so much difficulty in Forest Settlements.

Ravi.

31. The demarcation of forest in eight blocks on the Suíl was completed, and has since been finally agreed to.

Demarcation of eight blocks of forest on Suíl.

		Acres estimated.
I.—Bhandal block	(25 forests)	23,660
II.—Manjir	(1 „)	800
III.—Jimdh	(2 „)	400
IV.—Balái	(1 „)	80
V.—Kihár	(2 „)	180
VI.—Deúr	(1 „)	1,500
VII.—Himgari	(9 „)	6,950
VIII.—Barorota	(3 „)	330
		33,900

In many instances there are but little patches of forest, but in a thinly populated place like the Suíl Valley all remains of Deodár forest must be preserved, and every effort made afterwards to get other land to extend them.

In Suíl basin *everything*, even small pieces that can be got, must be taken; future extension to be aimed at.

32. In the spring Mr. Birnie Browne, Divisional Officer, was deputed with Mr. J. C. Brown, Assistant Commissioner, to demarcate all the available forest in the Shahpur Kandi taluqa comprising the sandstone and conglomerate hills covered with Chíl and with various fuel trees between the Ravi and the Chakki.

Settlement of Shahpur Kandi Chíl and fuel forests: steps taken towards.

He has found 22 forests, aggregating about 14,000 acres, still remaining. The forest from the country near Mádhopur, Pathánkot, &c., which would be most valuable, has entirely disappeared.

Results.

I have sent up this case suggesting that the forests should be managed as forests in which Government and the villagers are jointly interested under Section 79 by Government, the provisions of Chapter II. being notified.

Beas.

33. The erection of permanent demarcation pillars has begun around the Hoshiárpur forests, and in case of the bamboo forests cleared boundary lines have been adopted. The completion of this work and the grouping together of the very numerous little blocks of forest in the adjacent Kángra reserves (all gazetted separately) will now occupy attention.

Permanent pillars.

Sutlej.

34. Mr. Fendall commenced the examination of the forests below Tarunda on the Sutlej with a view of seeing what forest should be taken care of in the hitherto unnoticed valleys of the left bank of the Sutlej. This will be continued in 1879. The small patch of forest at Kotegarh, and some insignificant patches in Kotkai, were reported on, and it was determined that they could not be demarcated till settlement of the Umballa Division, which, however, is shortly to begin.

Examination of forest localities on the Sutlej.

A box forest has been discovered and at once demarcated with masonry pillars in the Pandrabís by Mr. Fendall.

A small box forest found and demarcated.

Plantation.

35. The survey and demarcation of the Lahore rakhs was begun, but the extraordinary difficulty of getting the correct boundaries of the different rakhs caused it to go very slowly. As these lands are mostly valuable, I proposed to survey them under Mr. Down, and demarcate those I wanted to keep as forest at the same time. It is surprising what differences the vernacular "shajrás" of settlement show.

Survey of Lahore rakhs begun.

SECTION 2 (A)—PROTECTION AND OFFENCES.

36. A long investigation was conducted by Colonel Millett, the Police Officer, and the Divisional Officer, regarding alleged misconduct of the Kághán Forest Ranger of various kinds, accepting gratuities and so forth; after all it was found that the charges were false. For his own sake I removed this officer to another Division.

Offences in Jhelum Division.

A Forest Ranger was convicted on the river of purposely undermeasuring logs, and was acquitted on appeal on a legal point which appears to me very doubtful. He has been dismissed.

37. Out of 22 forest cases in Hazára only 5 have been heard. On the Lower river out of 11 cases 10 were decided, and 57 out of 61 persons convicted: this does not look as if the Forest Officer was at fault sending up cases needlessly.

Delay in hearing cases.

I purposely omit to say anything about the fires and other offences in this district.

Rawalpindi.

38. One considerable case of fraud occurred in which a charcoal contractor made away with large quantities of wood without paying for it. The case was "discharged." I have taken legal advice on the point, and though that advice was unfavorable to the

Charcoal contractor's case.

validity of the discharge order, I felt that it would be undesirable to re-open the prosecution. The Forest Ranger, who was implicated in this business and in several others, was dismissed. Fires occurred as usual. Fortunately, however, very little damage was done by them.* The administration as regards protection of the forests (in spite of the great pains taken by Mr. Elliott) is extremely unsatisfactory. I am satisfied that the fault is not with the Divisional Officer.

Method of dealing with offences unsatisfactory.

Ravi Division.

39. There were no fires in this Division. A few logs were burned by the setting fire to grass on certain islands on the Ravi. This is doubtfully an offence, unless intention to destroy the logs or gross carelessness (the danger of mischief being known) were proved.

Offences in Ravi Division.

No fires.

Beas.

40. As regards fires, the failure of the winter rains dried up the Kulu forests, and 13 fires occurred, for which 135 persons were prosecuted. No fires, however, took place in the still drier Chíl forests of Nûrpur and Hoshiárpur. Some of the prosecutions for illicit felling, which are rather numerous, are due to the complicated distinction between trees growing on "shámilát" land and trees growing on "assessed" lands. A reform has been wisely introduced this year into Núrpur. The "shámilát" cuttings are now under the direction of the Forest Officer. Lopping is becoming less common; this is satisfactory.

Fires in Kulu.

None in the Chíl forests.

Control over "shámilát" in Núrpur.

Practice of lopping trees for fodder, &c.

Sutlej.

41. In Basahir there were several fires which occurred in all cases by setting fire to the grass. The people who set light to the grass were fined, and others helped very willingly to save the forest. Mr. Minniken gave a list of localities, nine in number (among which I do not recognize any of our Deodár forests), and as no Deodár was injured, I do not think there is much cause for alarm. I have no doubt that now this Division has been put under regular management, and with a defined position to the Forest Officer (as Political Assistant to the Superintendent of Hill States), the suppression of fires will be easy.

Small fires in Basahir.

Not injured the Deodár forests.

Now that there is regular management, will probably not recur.

42. Kalesar was burnt. The fires always come from Náhan and Chakrauli. As soon as the boundaries and rights of this tract are settled, I shall cut regular fire lines and see if a stop cannot be put to this, and it is quite useless to make the attempt while boundaries and rights are uncertain.

Kalesar forest.

Plantation Division.

43. Grazing ground being scarce, it is very natural that there should be a good many cases of cattle-trespass and rescue; but in this district cases are always promptly and adequately dealt with. It is quite possible to protect the forests efficiently.

Cattle-trespass.

* For this reason I have not printed a list of the localities.

(B). IMPROVEMENT OF THE FORESTS.

Work at Pîra Ghaib plantation.

44. Pîra Ghaib island plantation has not been extended. Various sowings took place on nurseries for future transplanting, but were destroyed by floods. I have been waiting, before undertaking any work here, to get the *levels* taken and see if we can improve the water-logged soil by any system of open drains. It is certain that *Sissu* does not thrive here, and I have, since the year closed, permitted the clear cutting (and removal by the roots) of two of the oldest compartments which I examined and found completely over-mature and dying at the top at an age of about 20—22 years.

Sissu, contrary to expectation, does not thrive.

The undergrowth both of Tallow tree and Mulberry, however, continues to spread. I have directed thinnings out of the more sickly Sissu in all compartments to favor this growth, and where it is absent, I intend to sow lines with Mulberry between the partly-cleared Sissu lines.

Nurseries in Hazára for the introduction of Deodár.

45. In the Hazára forest near Chánglagali the Kutli nursery was well stocked with small Deodárs, of which 80,000 were growing, and 40,000 *Pinus excelsa*. The introduction of Deodár and the extensive cultivation of *Pinus excelsa* on all blanks are the objects aimed at in these forests. Kujagali nursery appears to have little or nothing in it during the year. There was a nursery on the top of the hill at Chánglagali, but I directed this to be covered with *Pinus excelsa* and left. It was very proper to plant it up, but the place was quite unsuited for a nursery to supply plants.

Málkandi hill in Kághán.

Mr. Sparling reports no progress at all with the planting of the Málkandi hill (Kághán). This work was, however, probably delayed partly by the timber-work and partly by the Forest Ranger's suspension (Report 1877, para. 58).

Khánpur working plan sanctioned.

46. The Khánpur working plan has been sanctioned, and operations have commenced in one or two of the rakhs for the State Railway.

Rawalpindi.

Fencing of reserves by dry stone walls.

47. The only chance to improve our reserves is to fence them with low stone walls. This work has been carried out, but not as much as I had wished. Wherever it has been done it is successful. It costs about Rs. 300 to 350 a mile. About 3¼ miles were erected during the year at Márgalla, and about half mile as a beginning at Kawágarh. There are a few chestnuts, elms and *Eucalyptus* around the forest house at Ghoragali, but no forest garden is maintained ; the soil is indifferent.

Artificial aid to reserves.

Mr. Elliott reports that he could do nothing for transplanting from the nurseries to the reserves, as the rains failed.

Fuel Reserve, North.

Fences.

48. The fences of the Pabbi reboisement belt stretching along the railway on both sides have been kept in repair, and are effective. We have also been permitted to fence one of the Salt Range rakhs which is being cut by the State Railway, and a length of 24,000 feet of dry stone wall has been finished.

Closed rakhs.

49. The rakhs closed for reproduction remain as reported last year.

50. In the "Pabbi reboisement area" 700 acres were treated partly on the pit system (*potet*), and partly on prepared lines; the lines succeeded best; Sanatta (*Dodonæa viscosa*) "Phulai" and "Kíkar" are the species used. Transplants of "Phulai" succeed particularly well. A number of small ravines that were stopped by weirs constructed in stages have furnished irrigation water for the sowings, and at the same time silted up in a satisfactory manner. These silted beds are sown and planted afterwards. After putting in thorough order all the dams of 1877, a new set of ravines were taken in hand in 1878. This work must continue quietly; the expenditure on it is annually small, and the work well worth the money.

Sowings for Pabbi reboisement.

Works for closing ravines.

			Rs.	
Expenditure,	1876	....	2,247	(150 acres.)
Ditto	1877	....	1,300	(1,450 „)
Ditto	1878	....	857	(1,450 „)

51. To the "belas" on the Chenab 72½ acres have been added. Sadhoke is planted; Pindi Tátár is now completely stocked; and Nath will be finished this rains: the whole area is, however, very small,—289 acres all told. There are, however, 600 acres more, which I hope to obtain.

Planting of "belas" on Chenab.

Ravi.

52. The fences at Kálatop and Bakloh have been kept in repair. The Bára forest first fenced by me in 1871 has now almost completely restocked itself naturally with Chíl. I have directed the same work to be done with the next forest, Kúntla.

Fences and their good effects.

The Deodár growth in Kálatop is good, but there is at present little demand for the produce of the forest. We are quite unable to get rid of the pines. The total *successful* cultivation in the different compartments has been—

Deodár cultivation at Kálatop forest.

No. 7	.. .. ..	1,080	Deodár plants.
„ 8	.. .. ..	2,890	ditto.
„ 12	.. .. ..	840	ditto.
„ 14	.. .. ..	2,775	ditto.
„ 16	.. .. ..	7,230	ditto.
„ 20	.. .. ..	5,010	ditto.
„ 21	.. ..	2,126	ditto.
„ 22	.. .. ..	10,530	ditto.
		32,481	Total.

53. At Bakloh it is necessary always to keep the question of fuel for the cantonment in mind. I am anxious therefore to see several of the Chíl reserves partly (on the lower slopes for instance) stocked with deciduous trees. Nurseries have been prepared and were doing well in 1878; some are to be planted out in 1879. About 1200 *Acacia melanoxylon* have been raised, and the *Acacia stipulata* also succeeded well.

Conversion of Chíl forest at Bakloh into deciduous forest.

54. The only Deodár plantations in this Division actually existing are Bassu and Dhauri, both successful. Indeed when I last saw Dhauri my hope was that we may be permitted to plant up a great deal more of the waste land all round.

Deodár plantations in Chamba.

Beas.

55. There was the usual planting and sowing of Deodár with fair success. All the Deodár transplanting was done *with earth* this year. Manálghan forest was taken in hand

Deodár planting.

and more work done in Siál Biál and Dána Biál. Sowing at Jibi was reported successful in lines. I do not think much of sowing at Jibi (Latúra and Blajdhar forests), and feel quite sure that if the forest is *properly* cut out, *natural* reproduction will be abundant, except perhaps on the top of ridges where some aid may be required.

Cultivation of Tun in Kángra District.

56. In the Bajuri forest (Hamírpur) one thousand Tun trees were planted out. Persistent efforts must be made to re-introduce this valuable tree wherever possible in the Kángra forests.

In the "Tilli" forest also (Dera) some Tun has succeeded; also in Bihán forest (Dera). It is well to try it on several places first; but when once a suitable forest has been found, sowing will be confined to that till the area available is stocked.

Sutlej.

Restoration of Sapni forest by Deodár sowing.

57. The area of Sapni forest formerly burnt has been sown with Deodár by the method of three feet strips at 15 feet apart. The seed has germinated sparingly.

Other nurseries.

Besides this four nurseries were made at Sapni forest to furnish transplants, but the sowing failed from drought. At *Kunhái* a nursery prepared had better success. At *Runang* 25,000 young plants were ready, and were put out into the forest.

Fuel Reserve Division.

Improvement of Sarai Sidhu reserves.

58. I have prepared a working plan for the Sarai Sidhu reserves; this will be shortly produced. I did it with the help of Mr. Ellis, who furnished the survey data.

The six forests are now permanently demarcated. Compartments are separated by roads, which have also served in many cases as substitutes for old straggling paths across the forest, which are now closed. All the paths have not yet been cut clear of jungle, but the work is in progress.

Plantation Division.

Chánga Mánga thinnings.

59. The thinnings at Chánga Mánga are shown, as usual, in a table :—

No. of compartment thinned.	Area of compartment.	Age.	Average height.	Average girth.	Out-turn of Thinnings saleable.			Remarks.
					Area thinned.	Out-turn per acre.	Total out-turn of each compartment.	
	Acres.	Years.	Feet.	Inches.	Acres.	C. ft.	C. ft.	
1	86·64	10	25 to 35	10 to 36	27	260	7,030	
8	121·77	9	22 to 35	8 to 30	121	357	43,206	
17	64·77	7	15 to 25	6 to 18	64	267	17,061	
19	64·77	7	15 to 25	6 to 18	64	252	16,142	
29	68·02	6	15 to 25	6 to 18	4	380	1,519	
30	68·02	7	15 to 28	7 to 18	68	243	16,569	
31	68·02	9	25 to 38	7 to 24	68	355	24,124	
46	58·38	7	15 to 30	7 to 24	58	435	25,229	
54	120·02	8 & 9	17 to 30	6 to 21	120	484	58,049	
55	85·65	8	18 to 30	7 to 24	85	700	59,539	
56	83·04	8	18 to 30	7 to 24	72	366	26,382	A portion of this was thinned in 1877-78.
73	105·77	9	22 to 35	6 to 30	105	449	154,161	
74	148·51	9	22 to 35	6 to 30	148			
75	134·39	8 & 9	20 to 30	6 to 30	93			The remainder was thinned in 1877-78.
			Total		1,094	411	448,964	

60. The return shows the result in stacks of so many cubic feet; with this regular plantation we must now endeavour to ascertain the factor for reducing the cubic feet *stack* to the cubic feet *actual*.

Measure of wood sale adopted.

It is usual (where loading on railway, &c. requires *weight* to be counted) to take 450 cubic feet as weighing 100 maunds, of smaller stuff 500 cubic feet is taken.

61. The thinnings sold at Rs. 16 per 100 maunds (= about Re 4 per 100 cubic feet) for the larger stuff, and Re 15 per 500 cubic feet for the smaller, on the spot.

Sale of thinnings.

No transport to Lahore was attempted. But it is certain that wood will be bought at Chánga Mánga, not only to take to Lahore, but even to use on the Northern State Line.

Market for Chánga Mánga wood.

Thinnings in the Sailaba and sale.

62. In the Sailaba plantations :—

160 acres at Shahdara thinned yielded..... 81,630 cubic feet,
363 „ at Juggián ditto .....156,150 „

or about 100 maunds to the acre. In some places the thinning has been too severe.

The wood at this place has been sold on the spot for Rs 23-12-0 per 100 maunds, or about Re. 5-8-0 to 100 cubic feet.

63. The undergrowth of mulberry everywhere spreads naturally, being best in the Sailaba plantations ; next best in the irrigated Chánga Mánga plantations, and least good in Phillour and Ludhiána (unirrigated), *except* where the soil is moist.

Undergrowth of mulberry.

I have no doubt from observing the way in which a natural mulberry undergrowth has come up in my own garden at Lahore (where it is not wanted) that the mulberry is chiefly spread by birds, the carpels passing undigested and being deposited a number together thus the plant germinates in bunches, and a thick crop results.

64. Certain of the rakhs at Lahore have been closed to grazing during the year ; but until the boundaries and rights of the rakhs we want to retain can be settled, it is of no use attempting more. This work will, I hope, be completed this cold season. Meanwhile, the effect of closing is marked : indeed there can be no doubt that after rakhs are cut for fuel they *must* be closed.

Rakhs in Lahore closed, but not to much purpose.

Small *zizyphus* bush not cut now.

The "Malla" is not now allowed to be cut any where.

65. The only recent cultivation has been the IVth block of 4000 acres. We were indeed warned that very little water would be available for this block, but were hardly prepared for the *extreme* irregularity of the supply. The work has been chiefly done with Jand, and Sissu was used where there was prospect of success. The only mistake made was sowing mulberry in some lines in this place.

Recent cultivation at Chánga Mánga.

The work of 1877, except what had already failed from "kalr," survived the drought. During August (before which there was no rain or canal-water) the southern halves of compartments 90 to 106 were sown with "Jand" in continuous lines. In compartments 101—106 the seed did not germinate, because the canal-water was stopped (about 560 acres) ; this may require to be resown.

Some of the 1875-76 Sissu sowings (about 500 acres) were resown to replenish blanks, but the canal-water stopped, and the success is only very partial.

Conditions of the new block.

66. On the whole, considering the adverse circumstances of this IVth block, it is getting on fairly. It does not make the show that the other plantation does, partly because its growth is necessarily slow, and partly because it is largely of Jand, which makes no show when young.

Work on the Sailába. Present state of the forest.

The Jhok forest.

67. The "Sailába" now comprises one large group called "Shahdara forest," and the other, mostly on the other side of the river, called the "Jhok plantation." This latter consists of a rather large block on both sides of the river, about 18 miles from Lahore, and then two or three detached blocks along the river at intervals nearer Lahore.

Will be organised into one continued block.

I hope this winter to be able, by aid of some exchanges, and taking in some of the rakhs which we have, to organize this "Jhok forest" into *one continuous* block.

It is noticeable that one of the plots (Korotána) contains about 17 acres sown with Sissu 19 years ago by a District Officer. This is now stocked completely with a mulberry undergrowth, the Sissu being 2′—3′ in girth and 50′—60′ high.

A loss of 40 acres of stocked plantation occurred at the further end of this group (Chúng block).

Cultivation during the year in the Shahdara forest.

68. Turning to the Shahdara forest near Lahore, the Mahmúdbúti block still contains land to be planted, and plots that have not yet successfully been covered; 220,000 seedlings of six months' old Sissu were transplanted with success just after the floods. Long grass is still troublesome. A large number of willow cuttings failed.

Outlying plantations.

69. "Kíkar" in the Phillour plot suffered a good deal from storms. Sissu in Ludhiána does not do very well; the soil is too water-logged. It is on high drained river belas with *permeable sub-soil* that Sissu succeeds.

"Rakh improvements."

70. Under this head it was intended that a given area of rakh land should be taken in hand with its natural growth (if any) and aided by sowings, transplants, and so forth, to increase the growing stock. It was contemplated to sink wells and employ bullock power for the purpose of maintaining nurseries to supply the planting material, and also possibly to save alive plants that would otherwise be in danger of dying from drought.

Baoli Lehna Singh.

71. Mr. Minniken has developed this plan rather more elaborately than I meant; and Baoli Lehna Singh has been treated as a plantation at a considerable expense. The chief expense was putting a "bund" round the entire area; but the soil is so extremely bad and the growth so poor that we must not continue this work to any large extent.

The whole of this area about Rakhs Chhauni and Baoli Lehna Singh is regularly flooded by the overflow of the Bág Bacha, the Laila and other streams. This overflow has no outlet. The land has been utterly spoilt by the continued lying of water for many months year after year. If this area could be drained off into the Ravi, a large amount of land might be reclaimed. At the same time, as the floods have ruined the soil during the rainy months, the plants are equally liable to suffer from drought in the dry season.

Present condition of 1877 work.

Referring to the work of 1877, 200 acres planted on fair soil along the river Bhed died; 220 acres planted besides this were kept alive by wells. Of the 8000 holes that were sunk in the sour hard soil and filled with good soil, the plants were poor and stunted, though "Phulái" has lived.

Work of 1878.

The work of 1878 consisted in treating 80 acres by digging holes through the hard surface, and filling with good soil; 40 acres succeeded fairly; 20 acres failed from hot winds and drought; 67 acres were trenched and sown with Kíkar and Jand (one line of Kíkar to three of Jand); various repairs and resowings were also undertaken.

Wells and bullocks in this block.

In this place 33 (kacha wells) worked by 130 bullocks are kept (within the embankment).

Cultivation of Bakh Chichra.

72. No orders have yet been received on the *Chichra* cultivation, which therefore has not been extended. The Kíkar suffered very severely from frost, which was unusually heavy.

Kikranwáli.

73. At *Kikranwáli* sowings were killed by frost; so severe was the frost that some of the old *natural* growth of Kíkar on this plot died. In future I shall make repairs with *Jand* and *Bakain*.

So called "Carob plot" at Lahore.

74. The Carob plot at Lahore is getting covered with trees; and will always form a nice arboretum in time even if it does not answer its original purpose. Some Carob trees are, however, there, and many more can be grown, though with more care and cultivation than it would pay to give the trees in a larger plantation.

EXPERIMENTS.

75. I shall treat these by *species* as before, and add a few words about the forest gardens afterwards.

Australian Acacias.—The four species; *A. dealbata*, *decurrens*, *melanoxylon* and *pycnantha*, I wished to try them for the low hills like Pabbi, &c., for the islands and for fuel-supply at the middle Himalayan elevations. They decidedly fail at places like Pabbi—all four species.

At Pírа Ghaib island floods destroyed the sowings, so that results are not known; the results at Kolowal island (Chenab) are also not conclusive.

In the plains at Chánga Mánga, *A. melanoxylon* lives, but does not thrive.

At Bakloh, it seems to grow well (about 5000 feet).

In Chitríl forest (Núrpur Tahsíl under 4000) about 3000 of the *melanoxylon* were put out. Only about 15 per cent. took, but I think there must have been fault in transplanting; the oldest is now 7½ feet high and doing well.

In the "Lee garden," Kulu, all four species are doing well. *A. decurrens* makes most progress, being now 11 or 12 feet high.

The results of trials of the species at Subáthu are not yet known.

Mesquit bean and other species.

76. **Other Leguminosæ.**—*A. rupestris.*—A very few weakly trees survive at Chánga Mánga; they die down by frost, but recover. Of the *Prosopis* (Forbes Watson) 20 survive; they suffered from frost. *Prosopis pubescens*,—39 plants survive, they suffer less from frost than the other species. Of *Prosopis glandulosa* there are said to be over 100 plants, but not growing well. We have also what I believe to be 12 trees of *Pithecolobium saman* from Saháranpur.

77. **Eucalypti.**—The only places where trials are now carried on are at Chánga Mánga or Lahore for the plains, and the forest gardens in Kulu for the hills. Subáthu and the other Cantonments will form another centre naturally when the work there is more advanced.

Australian gums.

It is with regret that I report insufficient attention during the year in the Plantation Division to the careful labelling of every individual pot, bed or box in which the numerous species of *Eucalyptus* are sown.

Omission to name plants carefully.

The consequence is that names (which are all-*important*) have in not a few instances become lost. However well the species grows, we shall not know what it is till it is old enough to flower.

78. At *Chánga Mánga* a garden of two acres has now been laid out and carefully fenced close to the forest house.

Garden at Chánga Mánga.

The old trees remain healthy, except that two large trees (probably *resinifera*) near the canal died without apparent cause.

State of older trees.

They were examined; the tap root was found to go 18 feet into the ground, at which depth it was still 2″ in girth.

Mr. Vincent thinks that sun-burn of the exposed stem may be the cause. This tree should always be grown in groups, and no doubt protecting the stem by grass or other device has a good effect.

Last year's trees.

Of the seedlings reported in last year (1877)—

E. pilularis: eight plants survived and were put into the garden.

E. corymbosa: (not mentioned); two plants put out in the forest house compound.

E. crebra: the one plant died.

E. longifolia: none were found.

79. During the year I sent down a quantity of *E. obliqua*, *E. saligna*, *E. rostrata*, *E. amygdalina*, and the "swamp gum;" the whole of these through some carelessness were lost or destroyed.

Receipts of the year.

I also sent some *E. citriodora*, of which 70 plants are doing well; though not labelled, it is fortunately identifiable, two packets also of *E. resinifera* obtained from the acclimatized trees at Lucknow were received. There are a large number of unnamed seedlings, most of which are probably from this seed.

There are also 12 plants of either *E. saligna* or *E. viminalis* growing vigorously.

Towards the end of the year, large packets both of *E. goniocalyx* and *E. rostrata* were sent by the Inspector-General; most of this was reserved for Subáthu, but I have sown a little at Lahore, and both species germinate well, and seem to promise well even in the plains.

A small quantity of *E. obliqua* and *amygdalina*, obtained in February 1879 from Saháranpur, were sown, but are not yet much advanced.

80. On the Beas I reported last year that there were some *E. globulus* at the upper garden (Monáli), and that 17 species (small packets) had been sent chiefly to the lower garden ("Lee Garden" at Bandrol).

The winter proved too much for the *E. globulus* at Monáli, except 21 trees in a sheltered place.

At *Raisan* (just over 5000 feet) this tree does well.

Lee Garden.

81. The season at Bandrol was extremely unfavorable in spring, and I fear a considerable number of failures among the Eucalypti. Those that at present appear to be doing well are enumerated. I do not learn from the report that there are no other species *alive*, but these have been planted out, and are so far doing well.

E. stuartiana (5 feet high).
E. globulus (for Tasmania) 7—8 feet high.
E. globulus (for other localities) shows a less inluxuriant growth.
E. goniocalyx.
E. viminalis.
E. melliodora.
E. polyanthemos.
E. fissilis.
E. platypus.

Cork oak.

82. **Cork oak.**—Those at Pálampur died ; those in the Lower Kulu elevations suffer from heat, and it is now suggested that Monáli would be a better elevation for them. It will be well to remove a few to try.

English trees—
Oak.
Ash.
Elm.

83. **English trees.**—At Kálatop a number of the Oaks and Elms and a few Chestnuts are doing well, but a number appear to have died. The local report, however, is very meagre on the subject.

In the Monáli garden are all doing well—

107 Oaks (some are *Q. cerris* ; the rest mostly *robur*).
50 *Tilia* (Linden).
54 Elms.
59 Beech.
16 Mountain Ash.
1 Scarlet Chestnut.

Larch.

84. Four *Larch* trees are still doing well, and the *seed* of Larch reported last year has resulted in seedlings healthy enough, but not making much growth.

Ash.

In March 1873, a further supply of *Ash* and *Chestnuts* was received. A number of both have struck root.

85. **Abies Baborensis** (*Pinsapo*).—Through the kindness of a friend, who wrote to the Consul-General at Algiers, we have received some seed of the curious variety of *Abies Pinsapo*, which grows on Mt. Babor only. The seed sown at the end of January germinated freely in early April. A number of the seedlings died off (the stem apparently rotting close to the ground), but a number have survived, and are doing well both at Monáli and at Bandrol. I sent some of the seed to Ránikhet to the Conservator North-Western Provinces. I have not heard with what result.

Chestnuts.

86. **Sweet Chestnuts.**—Taking no account of a few trees at Kálatop (7500 feet), which is too high, a few at Balún (about 5000 feet), which are doing well ;—our principal stock is at Kulu and on the Sutlej.

600 Trees are planted out at Monáli; but I am inclined to think Monáli too high, and to move a number to Bandrol. Twelve trees presented to the Tahsíl garden at Sultánpur (only a little over 4000 feet) are doing well. At Bandrol one of Captain Lee's trees fruited for the first time.

On Beas.

During the year the Secretary of State sent out four boxes of seed which were despatched to this Division, but every single seed was found to be bad, either mildewed or dried up.

Secretary of State's seed.

I also sent three cases containing Ash and Chestnut *trees* together, some of which have begun to shoot.

87. On the Sutlej, there were of the older trees (1876) 17 surviving at Kilba and 28 at Nachár. The biggest at Kilba is eight feet high, at Nachár six feet. The trees, Mr. Minniken reports, at Nachár are "healthy but stunted."

Sutlej Valley.

During the year I sent four cases of *trees*, mixed Ash and Chestnuts, to this Division, and three of Chestnuts were received from the Secretary of State. As they had to be manipulated by a native officer who could not read English, it was impossible to discriminate the plants. A total of 1030 Chestnuts and 300 Ash were received.

The plants were taken out of the cases, banked up with earth and kept in the dark. They were taken out in May; up to date of sending in the report 330 Chestnuts and 70 Ash had put out leaves, and others were daily budding.

Considering the great difficulties of transport, this first experiment is satisfactory.

88. **Carob trees.**—We have had no new sowings during the year; but, as the Government desire the experiment to be continued, Mr. Vincent has written to Cyprus, Malta, the Riviera, &c., for seed, and I have taken steps to learn further about the grafting; but I think that Mr. Vincent's opinion is entirely correct on this subject, unless we can gradually modify the habit of the tree by acclimatization.

Carob tree.

In Europe the species flowers from August to October, and the seed ripens in the following July and August. In other words, 10 or 12 months are taken to mature the large full pod.

Reason why the fruit is so poor in the Punjab.

In our more 'rapid' climate the flowers appear in winter (December); the seed ripens by the end of May or first week in June. As noticed in a special report, this ripening appears to take place too hurriedly.

In India, in short, the fruit comes to maturity in less than six months instead of taking 10 or 12 months. The pods are consequently undeveloped and dry, the seed small and poor.

Unless, then, this defect can gradually be overcome, it is certain that the tree will not answer its purpose in the climate of the Punjab. From the Riviera Mr. Vincent has heard that this tree is never grafted, and that the poor seed here is not due to that cause.

89. **Catalpa.**—During the year I may mention I obtained and introduced some seed of the *Catalpa bignonioides*. A few plants have been raised by Agri-Horticultural Society at Lahore, and we have a number of plants growing wonderfully well at Chánga Mánga. Mr. Vincent has sent to America for more seed.

Catalpa.

ROADS AND BUILDINGS, &c.

Jhelum Division.

Road in Kághán.

90. The road in Kághán, spoken of in last report, was not *quite* completed during the year. A report of it is still awaited. It was impossible in such an out-of-the-way place to require an exact estimate first, but it is necessary to clear up the accounts that a definite statement should be submitted ; this has been called for. Meanwhile, there is no doubt that this work will have been a great assistance, not only in forest work, but to the public at large.

The principal *road-making* was from Parás to Búnja, about three miles, and nearly all through rock ; and the road (in other parts generally) has been improved.

No other work calls for notice.

Chenab.

Road along the Chenab.

91. Mr. Ellis has examined and reported on the road down the Chenab river, by which the Forest Officer ought to be able to leave and enter his Division without being dependent on the snow-bond Sánch Pass. In the face of the Kashmír famine and financial position generally, I have not thought it desirable to submit proposals.

Ravi.

Road to Barmaur from Chamba.

92. The Chamba State was engaged on making a road between Chamba and Barmaur. As this work is one of the greatest importance to the Forest Department, a contribution of Rs. 5,000 was sanctioned and paid to the Superintendent towards the work.

Other works.

93. All other Divisions contain the usual accounts of repairing roads bridges, and so forth, which do not seem to call for record, though of course they cost time and trouble.

I believe that the expenditure of this Department on buildings and repairs may be compared very favorably with that of any other Department under Government.

SECTION III.

Yield and Working.

Fellings for Government Depôt.

94. This was the last year of the Jhelum working, but it was thought right to cut no more trees, and the work of logging and launching what had been cut already occupied the time fully.

In addition to the logs from the fellings, wind-fall trees yielded 7215 logs, making a total of 11,644. The details may be seen in Form No. 54.

95. In *Dungágali* the fellings are shown in Form No. 53. Besides the trees felled for the scantling depôt, 903 trees were felled on permit, chiefly owing to a road having been (without any authority whatever) drawn straight through the Thobba forest to a new Military camp near Khairágali.

Depôt receipts on Jhelum.

96. During the year 6862 logs were received at sale depôts, 6545 being at Jhelum, the rest going past to Pind Dádan Khan and Shahpur.

All timber was of good quality, and nearly all cross cut. The size was large, 36·2 cubic feet to the log for Deodár, 26·5 for Pines.

No special notice of waif is made ; it is collected entirely by Kashmír, which pays us Rs. 4,000 for our share.

Chenab.

97. The receipts of timber from both rivers in Chamba are naturally now beginning to fall off. Nothing has been cut on either river but wind-fall, old logs, and so forth.

Timber receipts falling off. Old timber is now cleared out.

It is, I think, creditable to the management that while these forests have always paid their way, the forests have been comparatively little touched.

The whole fellings since 1869 (Deodár, unless marked otherwise) have been—

	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Chenab ...	797	976	...	39 dead.	952 dead	1003 dead. 748 *P. E.*	1841 dead. 248 *P. E.*	329 dead	887 dead.	308 dead & wind-fall.
Ravi ...	155	500	...	39 dead.	...	250 880 *P. E.*	350 dead	...	250	...

This includes the felling of *P. excelsa*, and does not include a few *A. smithiana* cut experimentally. The small cuttings under the working plan for Kálatop are excluded as practically a separate matter.

98. Counting also some old logs and waif, we launched 4310 logs during the year. At depôt 9621 logs containing 152,560 cubic feet were received, mostly short lengths and of poor quality (as might be expected). A few logs of Ash and Pencil Cedar have been received, but they are of poor quality, and are much split; they have been sawn into planks and stored up. The sale was 7731 logs (140,935 cubic feet) by auction, realizing Rs. 8-2-11 a log, and 5300 logs (64,440 cubic feet) sold at Re. 0-5-1 a cubic foot; the timber was bad. The same remarks apply here as on the Ravi.

Receipts at Depôt.

Ravi.

99. No fellings took place, but search is made to clear out all wind-fall logs in inaccessible places, and sawing these up locally was commenced. It is my intention to saw up nearly everything on the Ravi in future, to prevent the delay that occurs, as well as the risk of damage in getting logs over the canal head-works. With scantling there will be no difficulty, but increased facility for theft will occur.

Work in the Ravi forests to be mostly sawn timber in future.

100. The work was begun late owing to difficulties caused by our inadequate staff.

Only 9187 scantling and 10,911 logs were ready; the logs were launched.

101. I have been dissatisfied for a long time with the working of the river, and I hope a new state of things has now begun; the depôts were allowed to get filled with timber which lay there from year to year. All this has been now cleared out. A conference of Forest Officers, the Contractor, &c., was held with the Canal Officer at Mádhopur, and a new contract has been made and "Standing Orders" drawn up, which ought to work well.

System of working river revised.

102. A complete clearance has been made of all the old stock, but the stock consisting mostly of waif and old wood was not a valuable one.

Old stock completely sold off.

The general average price, *including* the old stock obtained, was Re. 0-6-3 per cubic foot for Deodár, and Re. 0-1-9 per cubic foot for Pines.

The whole quantity of Deodár sold was 6357 logs and 2881 of Pine, besides some scantlings of Pine wood. The falling-off in the receipts of the river are therefore *bonâ fide* due to the supply of timber being exhausted.

Fellings may now recommence.

103. This, however, is less to be regretted, as I have every hope that the demarcation of the forests will be so far complete, and that we shall be able to make a preliminary scheme of working, and that timber may fairly be felled in a year or two, when it comes to the turn of the Ravi to be worked. The same remark applies to the Chenab forests in Chamba.

Beas Division.

Fellings for Government.

104. The number of trees cut for scantling works, were as follows:—

Pokridár forest	4	These are all forests in which we know there is mature timber, and to be safely cut.
Bakriála-nál	148	
Nágadhár	395	
Balo	150	
Bagrori	55	
Blájdár	14	
	766	

These (together with a few wind-fall logs) yielded 16,705 scantling of sizes.

Enormous fellings for local grants.

105. The fellings for the zamíndárs, either gratis or at small prices, and including 1893 trees of all kinds (chiefly Kail) granted to Public Works, amounted to 31,421 trees, of which 364 were Deodár, 20,016 *P. excelsa*, 1069 *P. longifolia*, 7689 *A. smithiana* and *webbiana*, and the rest miscellaneous.

Depôt receipts.

106. The Depôt receipts call for no remark. Such deodár as came in log was of fair quality, averaging 12 feet in length and 24·80 cubic feet in contents. Some 40 logs of Walnut and apparently Maple were received (but the Maple are not included in the receipts, Form 55). The average prices obtained were Re. 0-11-4 for Deodár logs per cubic foot; Re. 0-6-7 for 2nd class logs, Re. 0-4-11 for Pine logs.

Preparation of timber specimens.

107. I may here mention, for this and all Divisions, that specimens of our principal woods are being carefully collected and seasoned, and that they will then be sent to Messrs. Ransome; but I have no intention of hurrying this experiment and injuring the reputation of the woods by sending pieces unseasoned and that will be covered with small cracks before they reach the port.

Experimental depôt at Amritsar.

108. An experimental depôt for scantling sale is opened at Amritsar, the scantling being taken by rail from Wazír Bhullar. 2330 pieces of sleeper size sold for Rs 5,059-14-0. Our expenses were per sleeper—

	Rs	A.	P.
Sawing, &c.	0	8	0
Carriage to river	0	8	0
Launching and clearing to Lárji	0	8	3
Rafting to Wazír Bhullar	0	3	9
Total ..	1	12	0

Rs. 468-10-6 were the rent and expenses of the depôt for year, exclusive of establishment, so that a profit of only Rs 514 was made. I do not think, however, that the scheme has had a fair trial; the depôt has been open a very short time, and yet there has been no loss. There must also be a *variety* in scantling, for it is not intended to make the depôt a *sleeper* market, but to offer pieces useful for building. The effect of this will be watched, and the depôt will be closed if after another trial it does not pay better.

There was little or no waif this year.

SUTLEJ.

109. This river was not in working. Preparations were made for commencing work in 1879-80. The grant of 404 *P. excelsa* trees and 3403 poles of Pines to zamíndárs was made.

Work of the year.

A sweeping party went down the river, however, and after landing some 82 logs at a trial depôt for the Simla market at *Sunni*, took all the rest to Phillour depôt.

110. The whole stock, 1025 logs of Deodár, 151 Pines, besides scraps and fire-wood, was sold off, realizing good prices. Deodár, 1st class, fetched 12 annas a foot; 2nd class Re. 0-8-2, Pines Rs 0-3-3 per cubic foot.

The timber was of fair quality, but small. Deodár logs containing average of 13·7 cubic feet, and Pines 12·6.

111. Kalesar yielded 2000 small poles and some bamboos.

112. It is a point of interest to notice the large export of sawn Deodár sleepers from different Hill States—

Bhajji	58,000
Mandi	31,000
Suket	15,000

All rafted to Phillour.

113. The percentage of the different dates of depôt receipts may here be given for the rivers that can show it. On Ravi and Sutlej the logs of former years bear no marks of the date.

YEAR OF FELLING.	Jhelum.	Chenab.	Beas.
	Per cent.	*Per cent.*	*Per cent.*
Before 1875	2·2	4·0	13·75
Of 1876	30 2	4·0	65 50
Of 1877	67·6	46·5	20 75
Of 1878	.....	45 5	.....

114. The fuel fellings may be seen from Table No. 53 where they are gathered together.

Fuel fellings from the Fuel Reserve Divisions.

The whole of the Lahore rakhs have now been cut out, and I doubt if a rakh can be found anywhere to cut. Even the Gujránwála rakhs are being cut, poor as they are, and yielded about 40,000 cubic feet.

115. The difficulty of supplying the requirements of Northern State Line at present is very great.

The Bhera and Phálián rakhs are too far off. The Salt Range area sufficiently near is very limited; from Rakhs Níli and Máuki 855,837 cubic feet, chiefly Phulái, were supplied during the year.

In Ráwalpindi some of the Kahuta forests have supplied 122,500 cubic feet of green hard wood fuel to the Railway.

Exploration of fuel tracts on the banks of the Jhelum.

116. Mr. Sparling was deputed to examine the slopes overhanging the Jhelum river, from Owen and below to be examined, and there is plenty of fuel there, if only we could get hold of the forest as reserve, and also if we could transport the material. Experiments are, however, being set on foot for this purpose: River floating may be possible, but Mr. Sparling thinks boats cannot be used. Hence the results of this proposal cannot be made clear till a quantity of fuel has been cut and methods of transport actually tried, which will be done this year.

CHAPTER III.

FINANCIAL RESULTS.

Revision of the whole Subordinate Establishment.

117. The establishment has been re-organized. While the number of forest guards and smaller posts generally has been reduced, a somewhat more reasonable number of Forest Rangerships has been created, and thus no doubt the staff has been considerably improved.

This establishment is nominally in slight excess (as to cost) over the last sanctioned scale of 1874. But this excess is only apparent, for the scale of 1874 being erroneously prepared it was eked out by appointments called "temporary," but really and of necessity permanent. These have been now abolished, and there are no irregular or temporary establishments of any kind. Such temporary establishments as are entertained are all sanctioned for fixed periods and for fixed purposes.

No temporary and irregular establishments now entertained.

The existing establishment was sanctioned in the lump-sum by the Government of India's No. 245 F dated 26th February 1878, and Circular No. 28 F dated 17th May 1878, and its distribution by the Punjab Government No. 115 dated 14th June 1878.

Revenue and expenditure of the year.

118. The *total* revenue and expenditure is thus shown—

		Rs.
Revenue		4,76,575
Expenditure	A. 2,58,952 / B. 2,64,602	5,23,554
	Deficit	46,979

This deficit is, however, purely nominal—

Deficit only apparent.

(I).—At the close of the year the Plantation Division happened to have Rs. 25,000 worth of timber, which has since been sold.

(II).—Then again the Deputy Commissioner of Montgomery, under some mistake as to a re-arrangement of rakhs which was never carried out, ceased to credit to the Forest Department the grazing revenue that belongs to us. This forms a large part of the outstanding in the Fuel Reserve Division, of Rs. 40,326, which can easily be adjusted.

(III).—Besides this, there is the fact that the Jhelum timber depôt was not sold, and it was full of fine Deodár, viz., 197,643 cubic feet. I kept this over and refused an offer of Rs. 1,01,812 on purpose to get a higher price for it, and since the year closed, I have sold the whole, Rs. 50,000 have been paid down in cash, and the rest is to be paid under the depôt rules.

119. These three are plain facts, and are not the result of any refined manipulation of figures. Hence there is no deficit.

And this is evident, not by manipulation of figures, but by plain facts.

120. On the other hand, there is no *large* surplus. In round numbers it is about Rs 1,17,000. I do not choose to take into account the rest of the unsold stock of Deodár, because it may or may not sell well. Nor do I press into service the rather large outstandings of grazing-revenue in the Gujrát and Shahpur Districts, for they may not all be recovered. If the Province were in a very paying condition, there ought to be a good surplus without these being taken into account, since they recur every year.

Surplus not large, but reasonable under circumstances.

121. At the same time I have read with great disappointment the renewed objections made to the small revenue of the Punjab, because I must say with the profoundest respect that the objections do not appear altogether consistent with the real state of the case.

Former objections to small surplus renewed.

122. It has of late been found necessary not only to leave this Province with a staff below its most ordinary requirements, but to withdraw from it (or at any rate leave it without) a proportion of trained officers. I have no distribution list before me, but it will be found that this Province has a far smaller proportion of trained officers than any other of the great Provinces under the Government of India, and yet it is a Province where professional knowledge is absolutely essential both for our plantations and for our demarcation work.

Exceptional difficulties of the Province.

123. Unless some assistance is given, it will be impossible to organize the fellings in the Chamba forests that may take place as soon as the forest areas are arranged—a work now approaching completion. Mr. Browne and Mr. Ellis are excellent officers, but neither would be able to make a preliminary plan of working the Deodár forests in their present state, though they would be able to give valuable help in making it. It will be extremely easy for me to direct large cuttings on these rivers, guided only by such knowledge as we possess. I have hitherto held back from doing this; but if it is impossible that a reasonable amount of assistance can be given, it will be necessary to issue these orders, in order to avoid the reproach that no surplus revenue is made.

We cannot continue to work on conservancy principles if no assistance is given and a surplus insisted on.

124. I beg that it may be borne in mind that this Province has to pay nearly forty thousand rupees annually* as lease money or share of forest, and that this charge should be deducted before a comparison is made with any province not so weighted. Moreover, I believe that a large share of the revenue which in the Cenral Provinces and elsewhere is credited to forests, and helps to show these Provinces so favorably, is here credited to Miscellaneous

Facts telling against the Forest revenue of this Province that are never taken into account.

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* Sutlej 10,000
Chamba 21,000
Hasára ..... 5,000 (it varies according to trees cut).
Kalesar forests in Kangra, &c., about 3,000
39,000

The Budget provision for this year is 32,400, but no large payments to Hasára are expected.

Land Revenue. Moreover, that it is part of our system to make large free grants of timber, which in other Provinces would be *paid* for and credited to Forest revenue.

125. I wish now to examine two points :—*first*, that the stock of old timber, &c. hitherto available is now really exhaused, so that we must soon begin fresh fellings ; *second*, that no increase has taken place in the *charges*, and that on all our works the strictest economy is observed.

Figures show that the stock of timber already out in the forests, &c. is now exhausted, but charges have not increased.

126. It will be observed from Form No. 56, taking *Deodár* only as our main staple, that the receipts at depôt for the year were far smaller. Separating from the totals the receipts of Jhelum (which is the river in *working*, and therefore not to be placed on the same basis as the rest) we have—

The stock of timber falling off tells in qantity and quality.

Year.	Jhelum.		Other Rivers.		Total.	
	Logs.	Cubic feet.	Logs.	Cubic feet.	Logs.	Cubic feet.
1876.....	986	17,917	36,393	499,149	37,379	517,066
1877.....	2,521	79,408	14,355	254,277	16,876	335,685
1878.....	6,447	233,258	16,016	262,318	22,463	495,576

The receipts have decreased really more than the total of "logs" would at first sight indicate, for the cubic contents and quality are altogether inferior. The actual number of logs in 1878 was a little larger than it was in 1877 ; (though both are only half of the number in 1876) yet the general average cubic contents (excluding Jhelum) in 1877 was 20·5 cubic feet, and in 1878 17·7, and this is a very fair index of quality.

The quality of the timber may be also judged from the average rates obtained per cubic foot—

	1876.		1877.	1878.	
	Annas.	*Pies.*	*Annas.*	*Annas.*	
Chenab	7	6	8	6	
Ravi	9	0	7	6	
Beas	14	0	11	10	
Sutlej	7	10	8	9	There is no old timber on Sutlej ; the value of the timber, therefore, remains about the same for the three years as might be expected.

127. At the same time there has been no increase of expenditure.

Charges not increased.

The average amount of all charges to be debited to timber gives per cubic foot—

	1876.	1877.	1878.
	Annas.	*Annas.*	*Annas.*
Jhelum	9	3	2
Chenab	2	6	1
Ravi	4	3	3
Beas	8	13	11
Sutlej	5	2	14

These charges are indeed (except on the average of a series of years) misleading. For instance, the whole of the Sutlej lease money (now *fixed* at Rs. 10,000) having been in 1878 charged against the timber (and there was very little, *vide* Form No. 55), raised the "charges" per cubic foot to 14 annas, which looks enormous.

The expenditure, however, under timber charges, has been reduced with our reduced supplies—

	1876.	1877.	1878.
Total A	2,70,330	2,58,949	2,58,952
„ A-I	1,41,631	1,14,427	1,21,432

The Ravi and the Beas alone spent rather large sums, but both were for sawing sleepers, the benefit of which cannot come into the same year.

Grazing revenue diminishes conservancy progresses.

128. There is also another difficulty as regards our revenue, viz., that as we conserve our forests better, as we settle the "rakh" tracts, and close them for reproduction, the grazing revenue must fall off. Now some progress has been made in this direction, and hence we see—

	Fuel Reserve, South.	Fuel Reserve, North.	Plantation.	
1876	1,06,610	55,483	6,145	
1877	1,02,507	49,038	5,673	
1878	* 93,350	44,295	6,500	This includes Gujránwála and Lahore; there are some outstandings not included.

This diminution cannot be avoided. The *rates* offered for grazing are remarkably stationary; consequently it is very much a question of the *area* in which, consistently with conservancy, grazing can be allowed.

Profitable working of the Dungágali Surveying Depôt.

129. The remarks made in para. 149 of last year's report regarding the plan of sawing up timber and selling it at Dungágali may be repeated this year.

19,704 pieces (mostly *A. webbiana*) and 496,767 shingles were cut. This was all sold but 2858 pieces, and yielded a *net* profit of Rs. 6,982.

Receipts and expenses of the Plantation Division.

130. The Plantation Division, in continuation of the table in para. 159 of last year's report, shows :—

	Receipts.	Expenditure.	
1877	11,746	75,755	
1878	14,100	69,461	Excluding Lahore rakhs, and a large stock of plantation wood *since sold*.

Outstandings.

131. I wish to make a few remarks on the two Tables, Nos. 51 and 52, showing the outstandings as to contractors' debits (Form No. 51). The Ravi outstanding will be recovered; it is the result of a dispute with the late rafting contractor.

The Chenáb is chiefly caused by Rs. 3,000, a sum advanced to a solvent contractor, who has to work it off in earth-work for trenches round the Gujránwála rakhs; the account is not yet closed.

The large outstanding, Rs. 73,905, in Fuel Reserve Division, has been adjusted since the close of the year. It represents the total of advances made to Sikandar Khán about eight years ago. The case has been under arbitration ever since, and has now been settled.

It should be remembered that the *total advances* without showing the work *per contra* are entered in these tables.

In the Plantation the advance, Rs. 7,345, chiefly consists of Rs. 4,000 advanced for trenching work in Lahore rakhs, and this will be worked off this cold season.

Outstandings of revenue.

132. As to outstandings of revenue (Form No. 52) the sum of Rs. 7,253 on Chenáb represents an outstanding of about 12 years ago: a suit has been filed in the Kashmir territory against the heir of the purchaser, who died. There is no chance of the money ever being recovered.

In the Fuel Reserve the large outstanding, Rs. 40,326, is chiefly due to a misunderstanding about the credit of grazing dues in Montgomery, and will be settled forthwith.

The Fuel Reserve, North, has Rs. 13,000 outstanding in Gujrát and Shahpur for grazing. This matter is under reference.

The Plantation outstandings will be recovered, except the Rs 7,253 above noted, and part of the grazing outstandings under Fuel Reserve Division, North; there are no bad debts to the Department.

133. The rates for work were—

Rates of work.

JHELUM.

1.	Catching and rafting to Baghám from	Rs.	1	8 to 2-8	per 100 c. ft.
2.	Ditto ditto Baghám to Jhelum	„	3	8	„ „
3.	Logs caught on islands to Jhelum	„	2	12	„ „
4.	Below Jhelum to Pind Dádan Khan	„	5	8	„ „
5.	Below Pind Dádan Khan to Shahpur	„	4	8	„ „

(Some attempt was made to reduce rates 1 and 2 without much success).

6. Landing at depôts, &c., 3 or 4 annas a log.

Sawing timber at gullies, Rs. 18 per 100 pieces.

CHENAB.

Felling, logging, launching and marking, all paid for in one rate, varying from length and girth up to 18 feet length according as girth is 72″, 100″ and above 100″ ...				... 6 as., 9 as. & 12 as. a log.
Catching and landing if at Riassi at ...	.. Rs.	1	7	per % c. ft.
Ditto if at various points in Aknúr beat	„	1	7 to 2 2	per % c. ft.
Ditto if at various points in Bijwát	„	1	0 to 1 12	„ „ „
Cutting holes for rafting topes	„	1	0	„ „ logs.
Cutting numbers			8 annas	„ „ „
Rafting to sale depôt	„	2	12	„ „ c. ft.
Do. from islands below depôt to sale depôt, Mooltan	„	5	0	„ „ feet.
Landing, classifying, &c., at sale depôt, about ...	„	15	0	„ „ logs.
Ditto at Mooltan depôt, about ...	„	10	8	„ „ „

RAVI.

Felling (separate charges)			4 annas	per tree.
Do. of dry or Chil at Bakloh			2 „	„
Logging			4 „	per log.
Launching (average)...	Rs.	1	2	„
Sawing, 4 annas per sleeper, or	„	31	14	per 1000 c. ft.
Do. (Kálatop conifers)	„	20	0	„ „
Do. (ditto hardwood)	„	25	0	„ „

Carriage in Kálatop, 9 annas to 1 rupee per piece.

Do. to Dalhousie, 2 annas per cubic foot.

Coolies 3 annas to 4 annas per diem.

BEAS.

Sawing sleepers in Jibi forests, 8 annas per sleeper.

Carriage, 6 miles, 8 annas 3 pies per sleeper.

Transport from Lárji to Depôt Wazír Bhullar, 3 annas 9 pies per sleeper.

Rafting *logs* to Wazír Bhullar.

Transport from Nadaun and Dera, Rs. 48 to 26 per 100 logs (according to size and weight).

Transport from Naushahra, Rs. 30 per 100 logs.

Ditto Nadaun (scantlings), Rs. 1-4-0 to Rs. 4-1-0 per 100 pieces.

Sawing up scantling on river-bed—Beams, Rs. 1 to 12 annas each.

Smaller pieces, 3 annas 6 pies, 4 annas 3 pies each.

Landing, &c. at Sale Depôt, Rs. 25 per 100 logs.

Ditto ditto (scantling), 4 annas to Rs. 1-8 per 100 pieces.

Carriage of scantlings from Wazír Bhullar to Amritsar Sale Depôt from Rs. 20 (15 feet beams) to Rs. 5 (5 feet beams) per 100 pieces.

SUTLEJ.

Forest.—Felling trees, 4 annas per tree.

Trimming, &c., 2 annas per tree.

Logging, 2 annas to 3 annas per log.

Rolling into river, &c., from Re. 1 to 2, according to locality.
Fencing plantations, Re. 1 per 100 running feet.
Collecting seed, Rs. 2 per maund.
Coolies, 4 annas to 5 annas per diem.

River.—Catching, Rs. 15-10 per 100 logs.
Cutting rafting holes, Rs. 3-8 per 100 logs.
Rafting to Phillour, Rs. 15 to 25 per 100 logs, according to distances.
Landing, classifying, &c., Rs 12-4 per 100 logs.
Carting to Phillour Depôt, Re. 1-4 to 1-14 per 100 cubic feet.

Kalesar.—Cutting poles according to size, 8 annas to Re. 1-9 per score.
Carting ditto to depôt 8 annas to Rs. 3 do.
Rafting by river to Abdullahpur, 8 annas to Re. 1-13 per score.

Fuel Reserve, North.

The same as stated last year.

Rawalpindi.

Felling Pine trees, 4 annas per tree.
Sawing scantling (including the felling and logging)—
Up to 15 feet, Rs. 18 per 100 pieces.
„ 18 „ 20 „ „
Beams 20 feet, Re. 1-8 each.
Carriage for 30 miles, 8 annas per piece up to 15 feet; special rates for larger sizes.
Cutting and stacking green fuel, 12 annas to Re. 1-8 per 100 cubic feet.
Do. do. dry „ Re. 1 to 2 per 100 cubic feet.
Carriage (Rawalpindi), Rs. 20 to 25 per 100 maunds for 25 miles.
Do. (Murree), Rs. 12 to 16 per 100 maunds for 5 to 12 miles.
Charcoal-burning, Rs. 25 per 100 maunds.
Coolies, 2 annas 6 pies to 3 annas per diem.
Skilled laborers, 8 annas to 10 annas per diem.

Plantation Division.

Trenching for plantation work on irrigated land, Rs. 1-8 to 2-8 per 1000 c. ft.
Sowing seed in lines, &c., 4 annas to Re. 1-8 per acre.
Transplanting, Rs. 3 to 7 per acre.
Stacking fuel, 8 annas per 1000 c. ft.
Carriage of fuel, 8 annas per 100 maunds per mile.
Clearing roads of brush-wood, grass, digging out roots of high grass, &c., Re. 0-2-9 per 100 running feet on a road 25 feet wide.

Collecting seed—Sissu .... Re. 0-5-4
Jand .... „ 1 to 2
Kikar .... „ 1-0-0
} per maund.

Fuel Reserve, South.

(Not received).

CHAPTER IV.

GENERAL REMARKS.

Yield of year as regards seeding of forest trees.

134. In most Divisions conifer seeds were abundant. In Pindi and elsewhere large quantities of *Pinus longifolia* seed were consumed for food.

In Kulu horse-chestnuts were exceptionally abundant, and the people of Plách Tahsil almost lived on them. They are soaked in water for a long time till the bitter principle is washed out and then used as flour.

In Plantation Division, Jand seed was reported scarce, but it is believed that it was really owing to the large consumption by poor people of the unripe seed-pod under the name of "Sangri."

Officers absent.

135. During the year one officer (Deputy Conservator 2nd grade) was dismissed. Two of our staff were on furlough, and three of the staff also absent on leave owing to sickness. With six officers short on the staff, the work of all Divisional Officers has been creditable to them.

B. H. BADEN-POWELL,

Conservator of Forests, Punjab.

27th June 1879.

Annual Form No. 45.

Forest Department, Punjab.

Area of Reserved Forests, 1878-79.

Division and District or Territory.	Name of Forest Range.	Area on 1st April 1878.		Added during the year.		Excluded or transferred to other heads.		Total on 31st March 1879.		No. and date of Notification of additions and transfers.	Remarks.
		Square miles.	Acres.	Square miles.	Acres.	Square miles.	Acres.	Square miles.	Acres.		
Jhelum—											
	Dungagali	63	40,383	...	...	...	...	63	40,383	...	Under Hazára Forest Regulation (33 Vic. Cap. 3).
Hazára	Kághán	90	57,487	...	...	...	...	90	57,487	...	Some deduction for area of Nathyagali, &c., not yet definitely settled; referred to Financial Commissioner in 1876.
	Sirau Valley ...	33	20,986	...	...	...	...	33	20,986	...	
	Khánpur	50	31,786	...	...	50	31,786	...	...	...	Transferred to Rawalpindi Division.
	Total ...	236	150,642	...	....	50	31,786	186	118,856	...	
Rawalpindi—											
	Khánpur	...	...	50	31,786	...	...	50	31,786	...	Under Hazára Forest Regulation (33 Vic. Cap. 3).
Ráwalpindi Tahsil	Márgalla	...	...	38	24,362	...	...	38	24,362	...	Act VII. of 1878, Notification No. 95 F dated 1st March 1879.
	Banigála	...	...	1	732	...	...	1	732	...	
	Tamaira	...	...	7	4,715	...	...	7	4,715	...	
	Maira	...	...	2	1,408	...	...	2	1,408	...	
Attock Tahsil ...	Kherimár	...	...	6	3,743	...	...	6	3,743	...	
	Kawágarh	...	...	7	4,396	...	...	7	4,396	...	
Fatahjang Tahsil	Khairi Márt ...	...	...	29	18,461	...	...	29	18,461	...	
	Kaulíál	...	...	2	1,171	...	...	2	1,171	...	
Gujjar Khan ,,	Bághám	...	...	12	7,983	...	...	12	7,983	...	
	Total ...	...	...	154	98,757	...	...	154	98,757	...	
Fuel Reserve, North	Gujrát Rakhs ...	...	...	2	1,562	...	...	2	1,562	...	Act VII. of 1878, Notification No. 109 F dated 6th March 1879.
	Islands in Chenab...	...	...	2	1,096	...	...	2	1,096	...	
	Pabbi Forest (Gujrát)	...	...	39	25,237	...	...	39	25,237	...	
	Total ...	...	...	43	27,895	...	...	43	27,895	...	
Chenab—											
Chamba ...	Darwás	3	2,181	...	...	...	...	3	2,181	...	Under lease from Chamba State, and rules pursuant to it.
	Kilár	7	4,288	...	...	...	...	7	4,288	...	
	Sanch	8	4,829	...	...	...	...	8	4,829	...	
	Purti	14	8,931	...	...	...	...	14	8,931	...	
	Tindi	29	18,884	...	...	...	...	29	18,884	...	
	Total ...	61	39,113	...	...	...	...	61	39,113	...	
Ravi—											
Chamba ...	Kálatop	4	2,870	...	...	...	...	4	2,870	...	Under lease from Chamba State and rules pursuant to it.
	Kaintíl	1	645	...	...	...	...	1	645	...	
	Baklo	2	1,280	...	...	...	...	2	1,280	...	
	Bauni Khet ...	1	537	...	...	...	...	1	537	...	
	Ravi and Sinl and tributaries.	150	96,000	...	...	...	...	150	96,000	...	
	Total ...	158	101,332	...	...	...	...	158	101,332	...	
	Carried over ...	455	291,087	147	126,654	50	31,786	602	385,953	...	

Annual Form No. 45.

Forest Department, Punjab.

Area of Reserved Forests, 1878-79—concluded.

Division and District or Territory.	Name of Forest Range.	Area on 1st April 1878.		Added during the year.		Excluded or transferred to other heads.		Total on 31st March 1879.		No. and date of Notification of additions and transfers.	Remarks.
		Square miles.	Acres.	Square miles.	Acres.	Square miles.	Acres.	Square miles.	Acres.		
	Brought forward ...	455	291,087	147	126,654	50	31,786	602	385,953	...	
Beas—											
Hoshiárpur District	Panjál	...	...	3	1,766	...	...	3	1,766	...	Act VII. of 1878, Notification No. 110 F dated 6th March 1879.
	Lohára	...	...	7	4,285	...	...	7	4,285	...	
	Dardi	...	...	5	2,952	...	...	5	2,952	...	
	Karnpur	...	...	6	3,804	...	...	6	3,804	...	
	Bindraban	...	...	4	2,529	...	...	4	2,529	...	
Amritsar ...	Gagriwál	...	...	1	581	...	...	1	581	...	Act VII. of 1878, Notification No. 113 F dated 6th March 1879.
Gurdáspur ...	Bagárián, &c. ...	...	...	1	887	...	...	1	887	...	(The old "Naushahra" Plantation) ditto.
Kángra District	Dera	...	...	18	11,042	...	...	18	11,042	...	Notification No. 111 F dated 6th March 1879.
	Núrpur	...	...	15	9,703	...	...	15	9,703	...	Notification No. 112 F dated 6th March 1879.
	Total ...	...	...	60	36,999	...	...	60	36,999	...	
Sutlej	Basahir	38	24,600	...	...	...	...	38	24,600	...	Under lease and rules pursuant to it.
	Total ...	38	24,600	...	...	...	...	38	24,600	...	
Fuel Reserve, South ...	Sarai Sidhu (Mooltan District).	...	...	51	32,770	...	...	51	32,770	...	Act VII. of 1878, Notification No. 114 F dated 6th March 1879.
	Total ...	...	...	51	32,770	...	...	51	32,770	...	
Plantation ...	Chánga Mánga ...	...	...	28	18,177	...	...	28	18,177	...	Act VII. of 1878, Notification No. 115 F dated 6th March 1879.
	Lahore Saulába — Shahdara *	...	...	2	1,236	...	...	2	1,236	...	This area includes the plantation and adjoining parts not planted, and includes the Gandián Rakh, over which a life right of grazing (declared at the old Settlement) subsists.
	Lahore Saulába — Jhok ...	...	...	4	2,776	...	...	4	2,776	...	
	Lahore Saulába — Sádhánwáli	...	...	...	349	...	...	...	349	...	
	Gujránwála Plantations.	...	...	2	968	...	...	2	968	...	Kíkránwáli 575 & Thatta Faqirulla 393 acres.
	Musang	...	...	...	87	...	...	...	87	...	A plot intended for experimental cultivation of the Larch.
	Amritsar Plantations	...	...	3	2,223	...	...	3	2,223	...	Sarai Amánat Khan 1340 acres, Nag 412 acres, Baháru 571 acres.
	Jullundur do.	...	...	1	539	...	...	1	539	...	Jullundur 50, Phillour 239, Sarangwál 2 blocks, (1) 250, and (2) not known.
	Ludhiána do.	...	...	...	190	...	...	...	190	...	Ludhiána Plantation.
	Umballa do.	...	...	...	183	...	...	...	183	...	Jagádhri do.
	Total ...	...	...	40	26,678	...	...	40	26,678	...	
	Grand Total ...	493	315,687	348	223,099	50	31,786	791	507,000	...	

* *An accretion of 40 acres by alluvion this year is included.*

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Forest Department, Punjab.

Area of Plantations, 1878-79.

Division.	Name of Plantation.	On 1st April 1878.		During 1878-79.		On 1st March 1879.		Remarks.
		Area in acres.	Total cost.	Area added.	Cost.	Total area.	Total cost.	
			Rs		Rs		Rs	
Jhelum ...	Pira Ghaib Island ...	441½	Not known	4	341	445½	...	Having once stated in the last report the experimental plantations in certain Divisions that have failed and are done with, I do not repeat them. I also strike out all small forest gardens which were disallowed by the Government of India's Circular of 5th November 1878. In such cases the places were planted up and left as part of the forest near which, or in which, they were situate. Places also are excluded which are mere *forest nurseries* to supply transplants for filling blanks or other artificial planting; they may be either permanent or temporary, according to their situation.
	Chánglagali	44	2,574	...	660	44	3,234	
	Kujagali	12				12		
	Kotli	10				10		
Rawalpindi ...	Khairi Márt	65	914	...	64	65	978	
Fuel Reserve, North	Pabbi. *reboisement* work	1,450	3,312	...	857	1,450	4,169	This provides for filling up blanks and resowing failures of last year.
	Pindi Tatár and Nath (Island Plantation) ...	37	594	72½	1,312	109½	1,906	
	Sádoke (ditto) ...	...	...	14	78	14	78	
Ravi	Bassu Plantation	149	3,227	...	...	149	3,227	The cost of this was given wrongly in last return.
	Dhanru ditto	25	106	...	...	25	106	
Beas	Manáli Forest Garden ...	2	396	...	...	2	396	(Sub-Alpine; over 6500 ft).
	Lee ditto ...	4	283	...	...	4	283	(Lower range; about 5000 ft).
Sutlej	Sholtu Plantation	6	586	...	...	6	586	
	Total of Forest Divns.	2,245½	11,992	90½	3,307	2,336	14,958	
Plantation	*A.—Chánga Mánga.*							
	Chánga Mánga	10,072	3,47,884	1,337	33,837	11,409	3,81,721	
	B.—Lahore Saildba.							
	Shahdara (Jugian, &c.)	1,196	20,892	40	3,101	1,236	23,493	
	Jhok and Sádhánwáli ...	1,315	20,767	...	1,038	1,315	21,805	
	C.—Outlying plots.							
	Nág	412	28,942	...	178	412	29,120	
	Jullundur	51	3,563	...	74	51	3,637	
	Phillour	239	18,264	...	127	239	18,391	
	Ludhiána	190	6,659	...	128	190	6,787	
	Jagádhri	184	9,266	...	129	184	9,395	
	Thatta Faqirulla	393	3,350	...	169	393	3,519	
	Mozang (Carob plot) ...	37	2,339	...	542	37	2,881	
	Subáthu	...	...	...	297	...	297	Nursery sowing started.
	Baoli Lehna Singh ...	585	21,303	56	6,850	641	28,153	Includes putting up a *bund* to enclose a large area against floods; watering by wells, &c.
	D.—Rakh improvements.							
	Kot Lakhpat Rakh ...	110	4,378	250	3,709	360	8,087	
	Chichra Rakh	55	4,442	...	456	55	4,898	
	Kikranwáli Rakh	576	2,424	...	1,379	576	3,803	
	Experiments	....	850	...	32	...	882	
	Plantation Division Expenditure	...	2,10,482	...	17,365	...	2,27,847	
	Total Plantation Division only	15,415	7,00,255	1,683	69,461	17,098	7,69,716	
	Total of whole ...	17,660½	7,12,247	1,773½	72,768	19,434	7,84,674	

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Forest Department, Punjab.

Prosecutions for breaches of Forest Rules during 1878-79.

Forest Division and Civil District.	*Injury to forest by fire.*		*Unauthorized felling or appropriation of wood and minor produce.*		*Grazing without permission or in tracts in which grazing is prohibited.*		*Other offences.*		Total.				Remarks.
									Prosecutions.		*Convictions.*		
	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	
Sutlej Division.													
Basahir	8	9	...	...	...	...	...	...	8	9	8	9	
Do.	...	...	9	9	...	...	...	...	9	9	9	9	
Bilâspur	...	...	...	...	...	...	5	7	5	7	5	7	
Suket	...	...	...	...	...	...	2	3	2	3	2	3	
Hoshiârpur	...	...	...	...	...	...	3	4	3	4	1	2	
Beas Division.													
Kângra	14	37	80	130	26	38	30	38	149	342	125	290	
Amritsar	...	...	1	2	...	...	...	...	1	2	...	...	
Gurdâspur	...	...	3	5	...	...	...	...	3	5	2	2	
Hoshiârpur	...	...	3	4	...	...	...	...	3	4	3	4	
Ravi Division.													
In Chamba Upper Sub-Division	...	...	2	2	...	...	8	11	10	13	9	9	
British jurisdiction, Lower Divn.	...	...	1	1	...	...	8	9	9	10	4	4	
Chenâb Division.													
Gujrânwâla	...	...	4	7	3	9	...	...	7	16	7	15	
Sialkot	...	...	3	3	...	...	...	...	3	3	1	1	
Kashmir territory	...	...	1	3	...	...	...	...	1	3	1	3	
Jhelum Division.													
Hazâra	...	...	17	79	5	12	...	...	22	91	5	5	
Jhelum	...	...	8	57	...	...	2	3	10	60	9	56	
Gujrât	...	...	1	1	...	...	...	...	1	1	1	1	
Rawalpindi Division.													
Râwalpindi	4	18	158	272	135	207	12	15	309	502	170	290	
Hazâra	...	...	4	4	3	5	...	...	7	9	1	2	42 cases pending.
Fuel Reserve North Divn.													
Jhelum	...	...	22	43	1	6	...	...	23	49	16	32	
Shahpur	...	...	1	4	5	11	7	13	13	28	12	26	
Gujrat	...	...	7	17	1	2	...	...	8	19	7	11	
Fuel Reserve South Divn.													
Montgomery	...	...	14	30	...	...	2	4	16	31	11	20	
Mooltan	...	...	6	17	...	...	6	13	12	30	9	19	
Muzaffargarh	7	17	3	4	...	...	8	20	18	41	4	6	
Dera Ghâzi Khan	...	...	4	8	...	...	2	6	2	6	...	...	
Plantation Division.													
Lahore	...	...	6	10	10	45	1	2	17	57	17	45	
Gujrânwâla	...	...	...	...	2	3	...	...	2	3	1	2	
Amritsar	...	...	...	...	4	9	...	...	4	9	4	7	
Jullundur	...	...	2	2	1	2	...	...	3	4	3	4	
Total ...	33	81	360	714	196	349	96	148	680	1,370	447	884	

Annual Form No 49.—[*Prescribed.*]

FOREST DEPARTMENT, PUNJAB.

Summary of Revenue of the different Divisions, 1878-79.

BUDGET HEADS, RECEIPTS.	Direction.	Sutlej Division.	Beas Division.	Ravi Division.	Chenab Division.	Jhelum Division.	Rawalpindi Division	Fuel Reserve Southern Division.	Fuel Reserve Northern Division	Plantation Division.	TOTAL.
I.—TIMBER AND OTHER PRODUCE REMOVED FROM THE FORESTS BY GOVERNMENT AGENCY—											
a. Timber		11,383 12 8	22,514 8 7	49,790 14 9	85,705 14 3	32,540 2 7	...	2 0 0	...	...	2,01,937 4 10
b. Fire-wood and charcoal		100 0 0	31 9 0	241 1 10	643 5 2	66 5 9	...	3,347 10 6	...	4,442 6 6	8,872 6 9
c. Bamboos		0 9 0	6,103 11 8	...	...	...	...	...	...	...	6,104 4 8
d. Sandal-wood		...	...	...	...	...	...	...	...	...	...
e. Grass and other minor produce		...	10 0 0	...	...	...	...	...	...	...	10 0 0
II.—TIMBER AND OTHER PRODUCE REMOVED FROM THE FORESTS BY CONSUMERS OR PURCHASERS—											
a. Timber		285 2 4	2,824 0 9	146 8 0	1 8 6	3,903 0 0	3,161 7 6	71 11 0	42 4 0	129 8 0	10,565 2 1
b. Fire-wood and charcoal		277 5 0	19 8 3	29 0 8	446 10 2	2,108 5 1	21,002 0 4	27,249 15 4	5,908 11 2	7,426 5 2	64,467 13 2
c. Bamboos		46 14 6	162 8 1	...	...	...	960 0 0	...	0 1 6	...	1,169 8 1
d. Grazing and fodder grass		233 7 6	7,186 1 9	...	36,950 14 0	5,462 7 10	3,890 9 0	35,406 4 1	44,295 1 2	20,537 2 6	1,53,961 15 10
e. Other minor produce		60 0 0	120 13 6	...	16 0 0	525 7 4	1,516 8 0	1,145 8 0	3 8 0	559 9 10	3,947 6 8
II.—CONFISCATED, DRIFT AND WAIF WOOD		612 3 9	384 0 6	...	19 4 11	8,263 14 0	...	5,094 12 3	...	...	14,374 8 5
IV.—REVENUE FROM FORESTS NOT MANAGED BY GOVERNMENT—											
a. Duty on foreign timber and other forest produce		...	...	...	...	...	...	...	...	...	...
b. Revenue from shared and private forests		...	1,021 13 0	...	...	...	...	...	...	...	1,021 13 0
V.—MISCELLANEOUS—											
a. Fines and forfeitures		...	1,156 12 3	1 0 0	...	198 6 0	...	558 7 11	43 9 6	3 5 0	1,961 8 8
b. Refunds		...	0 9 0	419 7 11	0 0 6	10 4 0	32 0 0	1,145 9 11	157 15 5	110 3 0	1,876 1 9
c. Other sources		83 4 0	319 0 3	196 0 2	1,352 6 3	424 5 2	296 6 0	1,552 1 1	1,459 9 5	622 2 3	6,305 3 1
TOTAL RECEIPTS		13,052 10 9	41,855 0 7	50,824 1 4	1,25,135 15 9	53,502 9 9	30,858 15 4	75,574 0 1	51,910 12 2	33,830 10 3	4,76,571 12 2

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FOREST DEPARTMENT, PUNJAB.

Summary of Expenditure of the different Divisions, 1878-79.

BUDGET HEADS A.—CONSERVANCY AND WORKS.	Direction.	Sutlej Division.	Beas Division.	Ravi Division.	Chenab Division	Jhelum Division.	Rawalpindi Division.	Fuel Reserve Southern Division.	Fuel Reserve Northern Division.	Plantation Division.	TOTAL.
I.—TIMBER AND OTHER PRODUCE REMOVED FROM THE FORESTS BY GOVERNMENT AGENCY:—											
a. Timber	11,305 0 0	2,285 4 5	31,879 0 8	22,712 1 10	12,080 1 8	41,170 6 1	...	...	...	...	1,21,431 14 8
b. Fire-wood and charcoal	...	...	...	...	17 12 0	0 6 0	...	833 0 10	...	1,077 1 6	1,928 4 4
c. Bamboos	...	...	1,817 0 5	...	...	...	...	...	...	...	1,817 0 5
d. Sandal-wood	...	...	...	...	...	...	...	...	...	...	...
e. Grass and other minor produce	...	...	101 0 0	...	...	...	...	...	...	...	101 0 0
II.—TIMBER AND OTHER PRODUCE REMOVED FROM THE FORESTS BY CONSUMERS OR PURCHASERS	...	...	69 6 0	210 0 0	...	181 9 2	352 5 4	75 0 0	489 2 1	52 9 0	1,429 15 7
III.—CONFISCATED, DRIFT AND WAIF WOOD	...	99 5 3	1 13 6	...	...	...	...	44 6 0	...	...	145 8 9
IV.—REVENUE FROM FORESTS NOT MANAGED BY GOVERNMENT:—											
a. Duty on foreign timber and other forest produce	...	...	...	...	...	...	...	...	...	...	...
b. Revenue from shared and private forests	...	...	...	...	...	...	...	...	...	...	...
V.—RENT OF LEASED FORESTS AND PAYMENTS TO SHAREHOLDERS IN FORESTS MANAGED BY GOVERNMENT	...	11,000 0 0	1,403 2 11	...	21,027 0 0	1,051 4 0	...	...	171 6 0	...	34,652 12 11
VI.—LIVE AND DEAD STOCK:—											
a. Purchase of cattle	...	...	...	...	...	...	...	...	...	1,014 0 0	1,014 0 0
b. Feed and keep of cattle	...	...	...	...	...	...	...	...	...	485 4 0	485 4 0
c. Plant, tools and instruments	86 0 0	5 10 0	619 0 9	299 10 3	285 3 9	946 4 3	143 9 6	372 7 3	360 3 9	923 12 6	4,041 14 0
VII.—COMMUNICATIONS AND BUILDINGS:—											
a. Roads and bridges	...	1,250 9 9	151 7 9	5,220 3 6	566 3 3	6,841 1 2	87 9 0	21 1 6	...	...	14,138 3 11
b. Buildings	...	810 8 2	743 14 9	1,091 0 1	258 0 0	1,293 4 2	100 0 0	22 5 0	460 8 1	458 2 3	5,237 10 6
c. Other works	...	...	11 15 6	...	438 5 0	19 15 0	46 12 0	...	234 11 10	...	751 11 4
VIII.—DEMARCATION, IMPROVEMENT AND EXTENSION OF FORESTS:—											
a. Demarcation	...	...	377 3 7	1,605 5 1	...	674 12 0	1,235 5 5	2,084 11 9	1,122 5 11	...	7,099 11 9
b. Compensation for land and rights	...	...	282 6 0	46 14 0	...	...	...	...	...	...	329 4 0
c. Surveys and working plans	...	0 10 0	...	...	674 9 7	639 3 2	...	2,253 13 2	6 16 6	278 1 11	3,853 0 4
d. Plantations	...	250 12 4	1,524 12 1	...	202 3 6	...	136 11 5	...	2,492 13 8	37,325 11 10	41,931 0 10
e. Protection from fire	...	...	24 6 0	4 2 0	...	...	...	...	...	2 13 0	31 5 0
f Other works	...	484 12 0	2,536 1 6	1,008 12 4	...	1,000 14 5	406 0 4	571 2 9	1,450 15 1	5,315 4 9	12,773 15 2
IX.—MISCELLANEOUS											
a. Refunds...	...	...	62 9 0	395 15 0	...	15 8 6	12 0 0	15 3 8	1 0 0	...	502 4 2
b. Law charges	332 0 0	...	...	266 5 0	326 0 0	16 13 3	50 0 0	350 0 0	21 3 6	12 3 6	1 374 9 3
c. Other charges	...	70 14 1	24 12 0	8 3 6	99 12 7	2,716 1 6	137 13 0	382 9 2	359 3 0	82 11 10	3,882 0 8
TOTAL A.—CONSERVANCY AND WORKS	11,723 0 0	16,258 6 0	41,630 0 5	32,868 8 7	35,975 3 4	56,567 6 8	2,708 2 0	7,025 13 1	7,170 3 5	47,025 12 1	2,58,952 7 7

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FOREST DEPARTMENT, PUNJAB.

Summary of Expenditure of the different Divisions, 1878-79.

BUDGET HEADS. B.—ESTABLISHMENTS.	Direction.	Sutlej Division.	Beas Division.	Ravi Division.	Chenab Division.	Jhelum Division.	Ráwalpindi Division.	Fuel Reserve Southern Division.	Fuel Reserve Northern Division	Plantation Division.	TOTAL.
Brought forward, Total A. Conservancy and Works ...	11,723 0 0	16,258 6 0	41,630 0 5	32,868 8 7	35,975 3 4	56,567 6 8	2,708 2 0	7,025 13 1	7,170 3 5	47,025 12 1	2,58,952 7 7
I.—SALARIES :—											
a. Conservators	18,432 0 0	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	18,432 0 0
b. Superior Officers...	8,925 0 0	3,000 0 0	14,827 0 0	14,550 0 0	7,729 0 5	15,800 0 0	5,400 0 0	9,950 0 0	5,419 10 3	8,409 10 11	94,010 5 7
c Subordinate Forest and Depôt Establishments...	... ...	5,627 11 3	11,904 3 6	7,561 4 0	8,058 15 2	8,662 14 6	5,786 1 5	12,929 2 7	9,287 9 3	10,207 4 6	80,025 2 2
d. Office Establishments	7,673 3 5	1,360 0 0	1,840 13 1	1,692 0 0	1,593 1 0	1,831 7 9	553 6 2	1,535 0 0	985 13 1	1,529 14 7	20,594 11 1
e. Deputation and Special Allowances	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	500 0 0	500 0 0
II.—TRAVELLING ALLOWANCES :—											
a Conservators	886 8 0	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	886 8 0
b. Superior Officers...	853 9 0	1,465 8 0	2,941 10 0	4,097 8 0	2,491 6 2	3,762 0 0	1,290 8 0	2,429 15 0	1,951 8 2	3,023 3 3	24,306 11 7
c. Subordinate Forest and Depôt Establishments...	... ...	669 13 9	2,023 2 3	829 1 10	541 13 4	1,260 8 1	328 0 10	557 14 4	401 3 6	1,144 2 1	7,755 12 0
d Office Establishments	386 5 11	378 14 1	533 9 10	729 10 0	534 10 0	462 12 5	86 7 7	105 2 2	156 5 9	332 13 11	3,706 11 8
III.—CONTINGENCIES :—											
a. Stationery	136 15 6	23 4 6	142 13 6	64 10 11	137 2 9	132 12 9	95 4 9	125 4 2	129 2 3	175 4 3	1,162 11 4
b Carriage of tents and records	213 5 5	218 [illegible] 0	416 2 3	550 0 9	463 0 4	596 10 3	101 1 11	85 6 8	219 14 7	14 4 3	2,878 6 5
c. Rents, Rates and Taxes	1,010 0 0	56 9 7	30 0 6	38 0 0	... ...	474 0 0	390 0 0	455 0 0	0 8 0	585 0 0	3,039 1 7
d. Pay of Police Guards	... ...	120 0 0	... ...	... ...	41 6 4	... ...	... ...	... ...	... ...	... ...	161 6 4
e. Official Postage	408 15 6	70 0 6	338 13 6	152 2 0	159 7 6	216 9 6	137 3 0	248 10 0	240 9 6	212 4 0	2,184 11 0
f. Sundries	891 12 7	719 11 4	354 14 10	213 15 9	586 7 6	1,061 7 9	124 3 4	212 8 3	397 3 0	397 3 4	4,957 7 8
TOTAL, B. ESTABLISHMENTS ...	39,817 11 4	13,708 1 0	35,353 2 9	30,478 5 3	22,336 6 6	34,261 3 0	14,292 5 0	28,633 15 2	19,189 7 4	26,531 1 1	2,64,601 10 5
GRAND TOTAL OF EXPENDITURE ...	51,540 11 4	29,966 7 0	76,983 3 2	63,346 13 10	58,311 9 10	90,828 9 8	17,000 7 0	35,659 12 3	26,359 10 9	73,556 13 2	5,23,554 2 0

Annual Form No. 50.—[*Pre cribed.*]

Forest Department, Punjab.

Dr. — *Account Current for the year* 1878-79. — *Cr.*

Cash Balance on 1st April 1878		...	...			20,178	11	3							
Revenue realized in cash,	Sutlej	Division	...	10,461	10	7									
	Beas	„	...	37,725	12	10									
	Ravi	„	...	41,368	6	6									
	Chenab	„	...	1,25,077	15	9									
	Jhelum	„	...	28,821	0	3									
	Ráwalpindi	„	..	30,665	12	8									
	Fuel Reserve South	„	...	71,973	3	7									
	Ditto North	„	...	48,689	5	8									
	Plantation	„	...	33,540	10	3	4,28,324	14	1						
Revenue adjusted by Book Transfer—															
	State Railways		...	22,810	8	5									
	Public Works Department		...	21,623	13	0									
	Military Department		...	3,815	8	6	48,249	13	11						
Remittances from State Treasuries			...	...			4,85,531	5	7						
Chamba State			...	...			9,267	3	0						
Advances Recoverable			...	...			2,13,230	0	3						
	Military Department		...	119	14	9									
	Government of India		...	536	9	9									
	Do.	Bengal	...	7	0	0									
	Do.	Punjab	...	105	2	0									
	Law and Justice—Jails		...	838	10	7									
	Public Works Department		...	532	14	0	2,140	3	1						
Contribution to Funds—															
	Uncovenanted Service Family Pension Fund		...	2,534	15	9									
	Madras Military Fund		...	557	9	11									
	Civil Ordinary Fund		...	480	0	0	3,572	9	8						
Deposits			...	...			4,636	8	8						
Suspense			...	...			732	14	10						
Amounts drawn from Treasuries on account of Office Rents			...	...			1,940	0	0						
		Total	...	...			12,17,804	4	4			Total	...	...			12,17,804	4	4

By expenditure under A.	Sutlej	Division	...	16,258	6	0						
	Beas	„	...	41,630	0	5						
	Ravi	„	...	32,868	8	7						
	Chenab	„	...	35 975	3	4						
	Jhelum	„	...	56,567	6	8						
	Ráwalpindi	„	...	2,708	2	0						
	Fuel Reserve South	„	...	7,025	13	1						
	Ditto North	„	...	7.170	3	5						
	Plantation	„	...	47.025	12	1						
	Direction	„	...	11,723	0	0				2,58,952	7	7
„ expenditure under B.	Sutlej	Division	...	13,708	1	0						
	Beas	„	...	35,353	2	9						
	Ravi	„	...	30,478	5	3						
	Chenab	„	...	22 336	6	6						
	Jhelum	„	...	34,261	3	0						
	Ráwalpindi	„	...	14,292	5	0						
	Fuel Reserve South	„	...	28,633	15	2						
	Ditto North	„	...	19,189	7	4						
	Plantation	„	...	26,531	1	1						
	Direction	„	...	39,817	11	4				2,64,601	10	5
„ Revenue Remittances—State Treasuries									...	...	...	4,27,283	4	4
„ Do. adjusted by Book Transfer									...	...	...	48,249	13	11
„ Public Works Department									...	...	...	15	8	5
„ Advances Recoverable									..	...	...	2,01,209	1	7
„ Deposits									...	...	...	2,722	10	4
„ Suspense									...	...	...	547	1	4
„ Government of the Punjab									...	...	...	105	2	0
„ Cash Balance on 31st March 1879									...	...	...	14,117	8	5

[MA.]

Annual Form No. 51.—[*Prescribed.*]

FOREST DEPARTMENT, PUNJAB.

Statement of Outstandings and Liabilities on account of Contractors, 1878-79.

Division.	Department Debtor.									Department Creditor.										Balance due.						Remarks.
	At commencement of year.				Recoveries in cash and value of supplies and work done during the year.			At close of year.			At commencement of year.				Payments made during year.			At close of year.			To Department (Outstandings).			By Department (Liabilities).			
	Rs.	A.	P.		Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.		Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	
Sutlej	...	...	...		1,085	6	11	1,085	6	11	119	6	11		966	0	0	1,085	6	11	...	...	...	...	...	...	
Beas	...	...	...		916	12	1	916	12	1	916	12	1		...	...	..	916	12	1	...	...	...	...	...	...	
Do.	...	...	...		59,502	4	1	59,502	4	1	16,015	1	10		49,036	12	0	65,051	13	10	5,549	9	9	...	...	...	
Ravi	86	15	11		2,520	12	10	2,607	12	9	2,520	12	10		86	15	11	2,607	12	9	...	...	...	...	...	...	
Do.	...	...	...		32,621	5	3	32,621	5	3	4,047	15	3		33,513	10	3	37,561	9	6	4,940	4	3	...	...	...	
Chenab	...	...	...		981	14	3	981	14	3	80	0	0	*A*	5,468	3	4	5,548	3	4	4,566	5	1	...	...	...	*A.* Rs. 3,000 from Fuel Reserve South.
Jhelum	...	...	...		200	0	0	200	0	0	200	0	0		...	...	...	...	...	...	...	...	...	...	...	...	
Do.	...	...	...		61,591	15	0	61,591	15	0	8,943	11	10		54,356	12	1	63,300	7	11	1,708	8	11	...	...	...	
Fuel Reserve South	...	...	...		1,098	8	0	1,098	8	0	1,803	8	0		...	...	...	1,803	8	0	705	0	0	...	...	...	Charged to C. and Works.
Ditto	...	...	...	*C*	8,511	14	6	8,511	14	6	80,849	9	8		1,567	9	5	82,417	3	1	73,905	4	7	...	...	...	*C.* Rs. 7,000 transferred to the Chenab and Plantation Divisions.
Fuel Reserve North	...	...	...		367	6	5	367	6	5	368	12	11		...	...	...	368	12	11	1	6	6	...	...	...	
Ditto	...	...	...		2,755	12	9	2,755	12	9	1,746	1	4		2,343	5	9	4,089	7	1	1,333	10	4	...	...	...	
Plantation	...	...	...		...	...	...	...	...	...	378	0	0		...	...	...	378	0	0	378	0	0	...	...	...	Charged to C. and Works.
Ditto	...	...	...		44,792	12	8	44,792	12	8	1,020	15	6	*B*	51,117	1	10	52,138	1	4	7,345	4	8	...	...	...	*B.* Rs. 4,000 from Fuel Reserve South.
Direction	...	...	..		7,950	11	10	7,950	11	10	170	0	0		9,120	2	5	9,290	2	5	1,339	6	7	...	...	...	
Rawalpindi	...	...	...		120	0	0	120	0	0	...	...	...		120	0	0	120	0	0	...	...	...	...	...	...	
TOTAL ...	86	15	11		2,25,017	8	7	2,25,104	8	6	1,19,180	12	2		2,07,696	9	6	3,26,877	5	2	1,01,772	12	8	...	...	...	

Annual Form No. 52.—[*Prescribed.*]

FOREST DEPARTMENT, PUNJAB.

Statement of Outstandings on account of Revenue, 1878-79.

DIVISION.	PARTICULARS.	Outstandings at commencement of year.			Value of sales and other revenue during year.			Total.			Amount realised during year.			Balance due to the Department at end of year.			REMARKS.
		Rs	A.	P.	Rs	A.	P.	Rs	A.	P.	Rs	A.	P.	Rs	A.	P.	
Sutlej	Timber, fire-wood and bamboos	...	...	...	12,705	15	3	12,705	15	3	12,705	15	3	...	...	...	
	Grazing and fodder grass	...	...	...	233	7	6	233	7	6	233	7	6	...	...	...	
	Miscellaneous	...	...	...	143	4	0	143	4	0	143	4	0	...	...	...	
Beas	Timber, fire-wood and bamboos	2,056	15	7	30,042	12	10	32,099	12	5	32,039	14	10	59	13	7	
	Grazing and fodder grass	261	6	0	6,978	11	9	7,240	1	9	7,196	1	9	44	0	0	
	Miscellaneous	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ravi	Timber, fire-wood and bamboos	6,771	14	0	45,273	0	2	52,044	14	2	50,207	9	3	1,837	4	11	
	Grazing and fodder grass	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Miscellaneous	...	...	...	616	8	1	616	8	1	616	8	1	...	...	...	
Chenab	Timber, fire-wood and bamboos	7,253	15	0	86,816	11	0	94,070	10	0	86,816	11	0	7,253	15	0	
	Grazing and fodder grass	...	...	...	38,179	5	1	38,179	5	1	38,179	5	1	...	...	...	
	Miscellaneous	...	...	...	1,368	6	9	1,368	6	9	1,368	6	9	...	...	...	
Jhelum	Timber, fire-wood and bamboos	2	8	0	47,495	3	5	47,497	11	5	46,881	11	5	616	0	0	
	Grazing and fodder grass	...	...	...	5,567	7	10	5,567	7	10	5,462	7	10	105	0	0	
	Miscellaneous	...	...	...	1,158	6	6	1,158	6	6	1,158	6	6	...	...	...	
Rawalpindi	Timber, fire-wood and bamboos	...	...	...	25,123	7	10	25,123	7	10	25,123	7	10	...	...	...	
	Grazing and fodder grass	...	...	...	3,890	9	0	3,890	9	0	3,890	9	0	...	...	...	
	Miscellaneous	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Fuel Reserve South	Timber, fire-wood and bamboos	2,812	0	0	34,788	10	9	37,600	10	9	*A* 37,600	10	9	...	...	...	*A.* Rs 1,833-9-8 transferred to Plantation Division
	Grazing and fodder grass	18,544	2	11	71,948	7	10	90,492	10	9	*B* 50,166	2	9	40,326	8	0	*B.* „ 11,363-2-0 ditto.
	Miscellaneous	302	0	0	6,226	1	0	6,528	1	0	4,401	10	11	2,126	6	1	„ 1,771-12-8 transferred to Chenab Division.
Fuel Reserve North	Timber, fire-wood and bamboos	...	...	...	5,971	1	3	5,971	1	3	5,951	0	8	20	0	7	
	Grazing and fodder grass	9,828	0	2	47,487	3	7	57,315	3	9	44,295	1	2	13,020	2	7	
	Miscellaneous	...	...	...	1,664	10	4	1,664	10	4	1,664	10	4	...	...	...	
Plantation	Timber, fire-wood and bamboos	776	1	11	12,091	5	3	12,867	7	2	11,998	3	8	869	3	6	
	Grazing and fodder grass	863	0	0	27,994	7	0	28,857	7	0	20,537	2	6	8,320	4	6	
	Miscellaneous	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	TOTAL	49,471	15	7	5,13,765	4	0	5,63,237	3	7	4,88,638	8	10	74,598	10	9	

Form No. 53.

FOREST DEPARTMENT, PUNJAB.

Statement of Trees felled during the year 1878-79.

Division.	Forest Range.	Locality.	Description of Trees.	On hand from previous year.		Felled during current year.		Total.		Disposed of during current year.			Closing balance.		Remarks.
				No.	C. ft.	No.	C. ft.	No.	C. ft.	How disposed of.	No.	C. ft.	No.	C ft.	
Jhelum ...	Kághán ...	Various ...	*P. Longifolia* ...	...	...	9	...	9	...	Sold ...	9	...	...	...	
	Dungagali ...	„ ...	*P. Excelsa* ...	...	...	57	...	57	...	Sawn up ...	57	...	...	...	Sawn for departmental depôt.
			„ ...	...	...	437	...	437	...	Sold ...	437	...	...	...	
			A. Webbiana ...	...	...	218	...	218	...	Sawn up ...	218	...	...	...	Ditto ditto.
			„ ...	...	...	22	...	22	...	Sold ...	22	...	...	...	
			P. Longifolia ..	...	..	23	...	23	...	Do. ...	23	...	...	...	
			Oaks ...	...	...	322	...	322	...	Do. ...	322	...	...	...	Of these, 237 = *Q. dilatata* the rest *Q. incana.*
			Other trees ...	...	...	47	...	47	...	Sawn up ...	47	...	...	...	Elm horse chestnut, &c. for departmental depôt.
			„ ...	...	...	90	...	90	...	Sold ...	90	...	...	...	Of these, 84 were *cotoneaster.*
Ráwalpindi ...	Ráwalpindi ...	Márgalla ...	*Odina Wodier* ...	...	...	3	...	3	...	Sold ...	3	...	...	...	(Kamlas) *Odina wodier.*
		Kalachitta ...	Other trees ...	...	...	28	...	28	...	Do. ...	28	...	...	...	
	Murree ...	Various ...	*P. Excelsa* ...	...	...	38	...	38	...	Do. ...	38	...	...	...	
			A. Webbiana ...	...	...	11	...	11	..	Do. ...	11	...	...	...	
			P. Longifolia ...	...	...	470	...	470	...	Do. ..	470	...	..	...	Of these, 157 were dead.
			Oaks ...	...	...	72	...	72	...	Do. ...	72	...	...	...	*Q. dilatata* and *incana.*
			Other trees ...	...	...	109	...	109	...	Do. ...	109	...	...	...	Of these 44 were olive.
	Kahuta ...	„ ...	*P. Longifolia* ...	...	...	280	...	280	...	Do. ...	280	...	...	...	202 of these were dead.
			Other trees ...	..	...	2	...	2	...	Do. ...	2	...	...	...	
	Khánpur ...	„ ...	„ ...	...	...	14	...	14	..	Do. ...	14	...	...	...	
Chenab ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ravi ...	Kálatop ...	Kálatop ...	Deodár ...	5	...	159	...	164	...	Sold ...	17	...	147	...	12 granted to Chamba State.
			A. Smithiana ...	12	...	...	...	12	...	Do. ...	...	...	12	...	For next season s sowing.
	Baklo ..	Baklo ...	*P. Longifolia* ...	...	...	2	...	2	...	Do. ...	2	...	...	...	
	Bannikhet ...	Bannikhet ...	...	...	...	11	...	11	...	Do. ...	11	...	...	..	
	Ravi ..	Various ...	Deodár ...	...	..	97	...	97	...	Granted ...	97	...	...	..	To State zamíndárs, &c.
	Barmane ...	Kukti ...	Pines ...	...	...	13	...	13	...	Do. ...	13	...	...	...	To zamíndárs.

Form No. 53.—CONCLUDED.

Division.	Forest Range.	Locality.	Description of Trees.	On hand from previous year.		Felled during current year.		Total.		Disposed of during current year.			Closing balance.		Remarks.
				No.	C. ft.	No.	C. ft.	No.	C. ft.	How disposed of.	No.	C. ft.	No.	C. ft.	
Beas ...	Kulu ...	Various ...	Deodár ...	...	...	1,130	...	1,130	...	Sold ...	1,130	...	...	...	Fellings for departmental work 760.
			P. Excelsa ...	...	...	20,016	...	20,016	...	Do. ...	20,016	...	...	...	
			Pines ...	...	...	8,759	...	8,759	...	Do. ...	8,759	...	...	...	
			Other trees ...	...	...	2,283	...	2,283	...	Do. ...	2,283	...	...	...	11 being alders.
	Kángra ...	„ ...	*P. Longifolia* ...	...	...	431	...	431	...	Do. ...	431	...	...	...	Of these, 361 were dead.
			Other trees ...	...	...	335	...	335	...	Do. ...	335	...	...	...	
	Hoshiárpur ...	Lohára, &c. ...	*P. Longifolia* ...	...	...	295	...	295	...	Do. ...	295	...	...	...	
	Amritsar ...	Gagriwal ...	Sissoo ...	...	...	1	...	1	...	Do. ...	1	...	...	...	
Sutlej ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Fuel Reserve South...	Dera Gházi Khan ...	Sanjar ...	Capparis aphylla ...	...	...	224	...	224	...	Sold ...	224	...	...	...	For rafters.
			FUEL FELLINGS (*sold in stack by the 100 cubic feet*).												
Rawalpindi ...	Murree ...	Various ...	Mixed ...	...	...	...	...	150,500	...	150,500	Sold ...	...	150,500	...	...	
	Kahuta ...	„ ...	„ ...	...	...	...	...	263,725	...	263,725	Do. ...	...	263,725	...	...	
Fuel Reserve North...	Salt Range ...	Nili ...	Mixed ...	...	...	...	...	838,716	...	838,716	Sold ...	...	838,716	...	...	Chiefly Phuláhi.
		Mánke ...	„ ...	...	...	...	...	16,671	...	16,671	Do. ...	...	16,671	...	...	Ditto.
Chenab ...	Gujránwála ...	Jhinda ...	Mixed ...	...	...	...	...	24,842	...	24,842	Sold ...	...	24,842	...	...	Jhand and Karil.
		Hamoke ...	„ ...	...	...	...	...	5,900	...	5,900	Do. ...	...	5,900	...	...	Ditto.
Fuel Reserve South...	Montgomery ...	Rakh Nos. 1—22 ...	Mixed ...	...	...	58,800	...	1,256,120	...	1,314,920	Sold ...	...	1,314,920	...	...	Jhand and Farásh.
	Mooltan ...	Sarai Sidhu ...	„ ...	...	...	53,331	...	...	...	53,331	Do. ...	...	53,331	...	...	Ditto.
		Lodhrán ...	„ ...	...	...	...	...	633,971	...	633,971	Do. ...	...	633,971	...	...	Ditto.
	Muzaffargarh ...	Sanáwan ...	„ ...	...	...	...	...	145,850	...	145,850	Do. ...	...	145,850	...	...	
	Dera Gházi Khan ...	Sanjar ...	„ ...	...	...	...	...	15,125	...	15,125	Do. ...	...	15,125	...	...	Part lost by flood.
Plantation ...	Chánga Mánga ...	Blocks I.—III. ...	Sissoo ...	...	...	196,939	...	448,563	...	645,502	Sold ...	...	225,064	...	420,438	
	Lahore Sallaba ...	Shahdara ...	„ ...	...	...	6,020	...	81,630	...	87,650	Do. ...	...	6,020	...	81,630	
		Juggian ...	„ ...	...	...	...	...	156,150	...	156,150	Do. ...	...	...	...	156,150	
	Sharakpur ...	Various ...	Jhand ...	...	...	...	...	371,546	...	371,546	Do. ...	...	323,546	...	48,000	
	Lahore ...	Tera ...	Sissoo ...	...	...	...	...	6,310	...	6,310	Do. ...	...	6,310	...	...	
		Baikuntha ...	Jhand ...	...	...	...	...	123,077	...	123,077	Do. ...	...	99,077	...	24,000	

Supplement to Form No. 53.

FOREST DEPARTMENT, PUNJAB.

Statement showing the sale of Fuel, Grass and other minor Produce, during 1878-79.

DIVISION.	Forest Range.	Locality.	Description of produce sold.	Number or quantity.	Rate.	Amount.	REMARKS.
						Rs	
Jhelum	Dungágali	Chánglágali and other gullies	Dry fallen wood	13,461 maunds	0/1/ per maund	841	Of this 9856 maunds collected by the Troops and consumed.
		Ditto	Ditto	14,617 cubic feet	0/1/ per 1½ c. ft.	609	Sold to Public Works Department and others.
		Ditto	Ditto	.....	.....	759	Issued by permits to the people in general.
	Kághán	Bálakot	Ditto	.....	.....	214	From rakh leases sold through District Officers.
	Lower Jhelum	Seila Island	Ditto	.....	.....	61	This is all dry fallen Shisham wood and loppings of dead branches.
		Pira Ghaib Island	Ditto	.....	.....	173	
		Jhelum Depôt	River-borne fragments and pieces used for raft, oars, &c.	.....	.....	269	
		Pira Ghaib Island	Grass cuttings	.....	.....	1,162	
		Seila „	Ditto	.....	.....	403	
		„ „	Thatch grass cuttings	.....	.....	200	Sold to Civil authorities for bridge of boats.
		Pira Ghaib „	Pilchi	.....	.....	32	Small tamarisk for basket-making, &c.
	Dungágali	Dungágali	Grazing dues, &c.	.....	.....	1,548	
	Khánpur	Khánpur Range...	Grazing	.....	.....	1,157	Realized before transfer to Ráwalpindi.
	Kághán	Kághan Valley	Ditto	.....	.....	1,268	
	Dungágali	Hírkot	Chil stumps	.....	.....	131	Sold at eight annas per stump and used for extracting tar.
		Do. and Sír	Chil bark	.....	.....	143	For tanning.
		Chánglágali	Muskbala	.....	.....	7	Valerian root used as a perfume, &c.
Ráwalpindi	Murree, Ráwalpindi, Kahuta, Attock, Fátahjang and Khánpur	Various	Fuel, &c.	.....	.....	13,212	Petty sales by the bullock load, &c.
			Grass and grazing	.....	.....	3,891	
			Lime and soorkhee kilns	.....	.....	1,468	
			Bamboos	.....	.....	960	
Chenab	.....	Gujránwála Rakhs	Petty wood sales	.....	.....	90	
			Grazing	.....	.....	36,951	
			Cultivation	.....	.....	63	
			Saltpetre	.....	.....	16	
			Miscellaneous	.....	.....	37	
Beas	.....	.....	Petty wood sales	.....	.....	3,244	
			Bamboos	.....	.....	163	
			Grazing, &c.	.....	.....	7,196	
			Miscellaneous	.....	.....	440	
Sutlej	.....	.....	Sál poles	2,263	.....	285	
			Fuel	510	.....	275	Sold by petty lots as bullock load, &c.
			Bamboos	3,902	.....	47	
			Grazing, &c.	.....	.....	233	
			Carried over	.....	.....	77,538	

Supplement to Form No. 53.

FOREST DEPARTMENT, PUNJAB.

Statement showing the sale of Fuel, Grass and other minor Produce, during 1878-79—concluded.

DIVISION.	Forest Range.	Locality.	Description of produce sold.	Number or quantity.	Rate.	Amount.	REMARKS.
						Rs.	
			Brought forward	.....	.....	77,538	
Fuel Reserve South	Mooltan	.....	Petty sales of fuel	.....	.....	394	
			Grazing and sale of grass ...	.....	.....	4,615	
			Soda-burning	.....	.....	700	
			Fishing	.....	.....	29	
			Miscellaneous	.....	.....	10	Said to be by sale of *Lotus plants*. I do not understand.
	Montgomery	.....	Petty sales of fuel	.....	.....	318	
			Grazing and sale of grass ...	.....	.....	45,688	
			Cultivation	.....	.....	2,271	Will, I hope, soon disappear as an item of income.
			Gul Kesu (Butea flowers) ...	.....	.....	7	Used as a dye and in making *Holi* powders, &c.
	Muzaffargarh	.....	Grazing and sale of grass, &c.	.....	.....	3,445	
			Fishing	.....	.....	14	
	Dera Gházi Khan	.....	Grazing and sale of grass, &c.	.....	.....	1,217	
Fuel Reserve, North	Shahpur	Rakhs	Petty wood sales	.....	.....	2,706	
	Jhelum		Grazing, &c.	.....	.....	47,959	
	Gujrát		Cultivation	.....	.....	679	
			Miscellaneous	.....	.....	517	Various small items, minerals, &c., &c.
Plantation	.....	Chánga Mánga Plantation and other plantations (including Peshawar)	Petty wood sales	.....	.....	7,581	Sales of small thinnings, twigs, &c., &c.
			Grazing, &c.	.....	.....	6,374	
			Miscellaneous	.....	.....	107	
			Kankar	.....	.....	32	
	.....	Lahore and Amritsar Rakhs	Petty wood sales	.....	.....	5,417	
			Grazing	.....	.....	14,513	
			Cultivation	.....	.....	542	
			GRAND TOTAL	.....	.....	2,22,675	

Form No. 54.

FOREST DEPARTMENT, PUNJAB.

Statement of Logs, Sleepers, and other Scantlings, cut and exported during the year 1878-79.

Division.	Forest Range.	Locality.	Description of Timber and Scantling.	On hand from previous year.		Cut during current year.		Total.		Disposed of during current year.			Closing balance.	
				No.	C. ft.	No.	C. ft.	No.	C. ft.	How disposed of.	No.	C. ft.	No.	C. ft.
Jhelum ...	Kághán	Dhannu	Deodár	2,061	...	1,202	...	3,263	...	Launched	3,263	...	...	...
		Nuri	Do.	10	...	...	...	10	...		10	...	...	...
		Sukhi kass	Do.	1,543	...	560	...	2,103	...		1,753	...	350	...
		Bunja	Do.	9	...	4,889	...	4,898	...		9	...	4,889	...
		Kamalban	Do.	806	...	361	...	1,167	...		1,167	...	...	...
		Biran	Do.	...	...	203	...	203	...		203	...	...	...
Chenab ...	Pangi	Tindi	Dead and dry L. Pines ...	1,284	12,840	...	...	1,284	12,840	Written off	1,284	12,840	...	...
		Not given	Deodár	...	...	4,057	74,964	4,057	74,964	Launched	4,057	74,964	...	...
			Pines	...	...	253	3,815	253	3,815	Ditto	253	3,815	...	...
Ravi ...	Kálatop ...	Kálatop	Deodár scantlings ...	98	119	1,251	1,555	1,349	1,674	Sold	287	503	1,047	1,159
										Used by Department	15	12		
			Do. slabs	14	18	...	...	14	18	...	...	...	14	18
			Tos scantlings	191	283	1,156	1,197	1,347	1,480	Used by Department	70	57	355	456
										Sold	922	967		
			Do. slabs	34	28	...	...	34	28	...	...	...	34	28
			Oak scantlings	144	116	...	...	144	116	Sold	4	4	140	112
Upper Ravi Sub-Division.	Suil	Bhandal	Deodár	15	...	...	...	15	...	Launched	15	...	...	...
		Duir	Do.	160	...	...	...	160	...	Ditto	160	...	...	...
Beas ...	Upper Beas	Dhangi	Deodár scantlings	7	8	...	...	7	8	Ditto	7	8	...	...
		Sandhar	Ditto	4,597	19,339	...	...	4,597	19,339	Ditto	1,003	3,783	3,594	15,556
		Latura	Ditto	1,202	4,180	137	178	1,339	4,358	Ditto	1,339	4,358	...	...
		Ślajdhar	Ditto	7,007	24,638	886	1,206	7,893	25,844	Ditto	7,893	25,844	...	...
		Saloun	Ditto	2,674	9,356	549	1,164	3,223	10,520	Ditto	3,223	10,520	...	...
		Jibi	Ditto	300	1,053	55	104	355	1,157	Ditto	356	1,157	...	...
		Bagruri	Ditto	360	1,261	1,593	4,941	1,953	6,192		...	...	1,953	6,192
		Pokridhar	Ditto	2,945	10,257	437	682	3,382	10,939	Launched	3,382	10,939	...	...
		Bakrialahai...	Ditto	2,071	7,186	5,213	16,430	7,284	23,616		...	...	7,284	23,616
		Nagadhar	Ditto	4,107	14,250	5,231	16,453	9,338	30,703		...	...	9,338	30,703
		Ballo	Ditto	...	...	2,524	8,214	2,524	8,214		...	...	2,524	8,214

Form No. 54.

FOREST DEPARTMENT, PUNJAB.

Statement of Logs, Sleepers, and other Scantlings, cut and exported during the year 1878-79—concluded.

Division.	Forest Range.	Locality.	Description of Timber and Scantling.	On hand from previous year.		Cut during current year.		Total.		Disposed of during current year.			Closing balance.	
				No.	C. ft.	No.	C. ft.	No.	C. ft.	How disposed of.	No.	C. ft.	No.	C. ft.
	Lower Beas ...	River Islands between Dada and Naushahra.	Deodár Scantlings 13× 9×5	36	146	5	20	41	166	Launched	41	166	...	...
			12×10×5	19	79	117	489	136	568	Do.	133	556	3	13
			11×10×5	11	42	94	358	105	400	Do.	105	400	...	...
			10×10×5	71	247	64	222	135	469	Rafted	112	389	23	80
			9×10×5	32	100	57	178	89	278	Do.	83	259	6	19
			8×10×5	47	130	36	100	83	230	Do.	71	196	12	34
			7×10×5	9	22	24	58	33	80	Do.	21	51	12	29
			6×10×5	7	15	...	...	7	15	Do.	7	15	...	...
Sutlej ...	Basahr ...	Tickru	Deodár	1,232	...	...	...	1,232	...	...	...	...	1,232	...
		Nachar												
		Kilba												
			Total ...	33,103	105,703	30,954	132,328	64,057	238,031	...	31,247	151,803	32,810	86,228

Annual Form No. 55.—[*Prescribed.*]

Forest Department, Punjab.

Statement of Timber and other Produce brought to Depôt from the different Forest Divisions, 1878-79.

Division.	Forest.	Description of Timber, &c.	No. of		Total of each Division.	
			Pieces.	Cubic feet.	Pieces.	Cubic feet.
Sutlej	Basahir	1st Class Deodár	...	...	110	2,152
Beas	Upper Beas	Ditto	...	...	66	2,662
Ravi	Do. Ravi	Ditto	...	...	961	21,559
Chenab	Pangi	Ditto	...	...	4,040	81,004
Jhelum	Kághán	Ditto	...	...	4,943	204,115
		Total ...	...	...	10,120	311,572
Sutlej	Basahir	2nd Class Deodár	...	...	1,082	13,792
Beas	Upper Beas	Ditto	...	...	190	8,680
Ravi	Do. Ravi	Ditto	...	...	4,967	77,820
Chenab	Pangi	Ditto	...	...	4,600	59,569
Jhelum	Kághán	Ditto	...	...	1,504	29,143
		Total ...	...	...	12,343	184,004
Sutlej	Basahir	Pines	...	...	151	1,906
Beas	Upper Beas	Do.	...	...	69	1,088
Ravi	Do. Ravi	Do.	...	...	2,771	48,725
Chenab	Pangi	Do.	...	...	970	11,811
Jhelum	Kághán	Do.	...	...	414	10,981
		Total ...	...	...	4,375	68,511
Beas	Scorái	Deodár scantlings 5 by 8 by 4 ...	621	533	...	...
Do.	Do.	Ditto 6 by 8 by 4 ...	4	5	...	...
Do.	Do.	Ditto 6 by 8 by 8 ...	1	3	...	...
Do.	Do.	Ditto 6 by 10 by 5 ...	7	15	...	...
Do.	Do.	Ditto 7 by 10 by 5 ...	33	80	...	...
Do.	Do.	Ditto 8 by 10 by 5 ...	88	229	...	...
Do.	Do.	Ditto 9 by 5 by 5 ...	4,415	13,774	...	...
Do.	Do.	Ditto 10 by 10 by 5 ...	135	467	...	...
Do.	Do.	Ditto 11 by 10 by 5 ...	105	400	...	...
Do.	Do.	Ditto 11 by 12 by 8 ...	32	234	...	...
Do.	Do.	Ditto 12 by 5 by 5 ...	25	52	...	...
Do.	Do.	Ditto 12 by 10 by 5 ...	1,078	4,463	...	...
Do.	Do.	Ditto 12 by 12 by 8 ...	17	136	...	...
Do.	Do.	Ditto 13 by 9 by 5 ...	45	182	...	...
Do.	Do.	Ditto 13 by 12 by 8 ...	8	69	...	...
Do.	Do.	Ditto 14 by 9 by 5 ...	14	61	...	...
Do.	Do.	Ditto 14 by 12 by 8 ...	8	74	...	...
Do.	Do.	Ditto 15 by 5 by 5 ...	20	52	...	...
Do.	Do.	Ditto 15 by 10 by 5 ...	688	3,577	...	...
Do.	Do.	Ditto 15 by 15 by 10 ...	2	31	...	...
Do.	Do.	Ditto 16 by 15 by 15 ...	2	33	7,417	24,593
Ravi	Kálatop	Ditto	1,251	1,554	...	...
Do.	Do.	Tos scantlings	1,156	1,195	2,407	2,749
Chenab	Pangi	Scantlings of sorts	...	...	445	359
Jhelum	Dungágali	Ditto	...	...	19,704	23,873
		Total ...	...	...	29,973	51,574
		Fancy Wood.				
Sutlej	Kalesar	Sál poles	...	...	2,351	...
Beas	Solang	Walnut	...	...	49	315
Chenab	Pangi	Pencil Cedar	2	23	...	...
Do.	Do.	Tun	1	15	...	...
Do.	Do.	Ash	2	29	...	...
Do.	Do.	Walnut	6	48	11	115
Jhelum	Kághán	Pencil Cedar	...	...	1	22
		Total ...	...	...	2,412	452
Sutlej	Basahir	Scraps and pieces	...	...	1,296	4,376
Beas	Upper Beas	Ditto	...	...	307	353
Ravi	Do. Ravi	Ditto	...	...	1,754	2,472
Chenab	Pangi	Ditto	...	...	...	2,251
Jhelum	Kághán	Ditto	...	...	9	50
		Total ...	...	...	3,366	9,502
		Grand Total ...	...	...	62,589	625,615
Beas	Hoshiárpur and Dhamtal, in Kángra.	Bamboos	...	...	384,432	...

Annual Form No. 56.—[*Prescribed.*]

FOREST DEPARTMENT, PUNJAB.

Account of Timber and other Produce, 1878-79.

Particulars.	Pieces.		Total.		Particulars.	Pieces.		Total.	
	No.	Cub. feet.	No.	Cub. feet.		No.	Cub. feet.	No.	Cub feet.
Balance in hand at commencement of year.					*Removed by Purchasers.*				
Deodár in log	5,808	84,546			Deodár in log	22,017	367,770		
Pines in log	35	535			Pines in log	4,050	60,563		
Scantlings of sorts.....	7,883	10,514			Scantlings of sorts ...	26,293	42,685		
Fancy wood	26	150			Fancy wood	1,879			
Scraps and pieces	4,253	16,023	17,505	111,769	Scraps and pieces	6,643	25,302	60,882	496,320
Charcoal.....	...	...	2,702		*Lost or used by the Department.*				
Received during the year.					Deodár in log	22	559		
Deodár in log.....	22,463	495,576			Pines in log	16	291		
Pines in log	4,375	68,511			Scantlings of sorts ...	3,177	3,343		
Scantlings of sorts.....	29,973	51,574			Ditto made over to Mandi State	108	297		
Fancy wood	2,412	452			Fancy wood	39	245	3,362	4,735
Scraps and pieces	3,866	9,502	62,589	625,615	Charcoal	...	...	2,702	
					Balance in hand at close of year.				
					Deodár in log	5,732	211,795		
					Pines in log	344	8,192		
					Scantlings of sorts ...	8,278	15,763		
					Fancy wood	520	357		
					Scraps and pieces.....	976	223	15,850	236,330
GRAND TOTAL ...	...	...	82,796	737,884	GRAND TOTAL ...	...	...	82,796	737,384

Form No. 57.

FOREST DEPARTMENT, PUNJAB.

Statement showing the Amount realized on account of the different classes of Timber and other Produce sold during 1878-79.

DIVISION.	Description of Timber, &c.	No. of pieces, &c., sold.	Cubic contents.	Amount realized and due on account of sales.			Average amount per log, &c.			Average cubical contents of logs.	Average amount per cubic foot.			REMARKS.
				Rs.	A.	P.	Rs.	A.	P.		Rs.	A.	P.	
Satlej	Deodár	1,108	15,347	8,459	0	0	8	0	0	13	0	9	0	
Do.	Pines	109	1,369	278	0	0	2	8	0	13	0	3	0	
Do.	Sál poles	1,879	.....	2,647	0	0	1	8	0	.....	.....	...	...	
Do.	Scraps	.....	1.000	100	0	0	.....	...	...	.....	0	1	0	
Beás	Deodár	445	12,672	8,214	0	0	18	8	0	28	0	10	0	
Do.	Pines	60	814	253	0	0	4	0	0	14	0	5	0	
Do.	Scantlings	4,242	14,750	12,048	0	0	26	8	0	3	0	14	0	
Do.	Scraps	307	353	31	0	0	0	1	6	1	0	1	0	
Do.	Bamboos	401,532	.. ...	6,104	0	0	.....	...	...	.....	.....	...	...	Rs. 15 per thousand.
Do.	Miscellaneous	.....	.....	10	0	0	.....	...	...	.....	.....	...	...	
Ravi	Deodár	5,906	98,388	38.415	0	0	6	8	0	16	0	6	0	
Do.	Pines	2,771	42,724	4.986	0	0	1	14	0	15	0	2	0	
Do.	Deodár scantlings	263	457	720	0	0	2	11	0	2	1	8	0	
Do.	Tos do.	912	960	494	0	0	2	0	0	1	0	8	0	
Do.	Oak	4	3	2	0	0	0	8	0	1	0	10	0	
Do.	Scraps	1,754	2,472	481	0	0	0	4	0	1	0	3	0	
Chenab	Deodár	13,035	205,494	83,681	0	0	6	6	0	16	0	6	0	
Do.	Pines	889	10,798	2,025	0	0	2	8	0	12	0	3	0	
Do.	Scraps	.....	4,955	643	0	0	.....	...	...	.....	0	2	0	
Jhelum	Deodár	1,512	35,334	18,828	0	0	12	8	0	23	0	8	0	
Do.	Pines	232	5,065	943	0	0	4	0	0	12	0	3	0	
Do.	Scantlings	20,859	25,620	10,810	0	0	0	8	0	1	0	7	0	
Do.	Shingles	496,767	.....	1,959	0	0	.....	...	...	.....	.....	...	...	
Do.	Scraps	.....	.....	66	0	0	.....	...	...	.....	.....	...	...	
Fuel Reserve, South	Fuel	.....	15,323	3,348	0	0	.....	...	...	.....	0	3	6	
Plantation	Do.	.....	79,502	4,495	0	0	.....	...	...	.....	.....	...	...	
	Total	954,586	573,400	210,040	0	0	.....	...	...	.....	.....	...	...	
DEDUCT— Amount due but not realized during the year				53	0	0								
Balance				2,09,987	0	0								
ADD— Amount realized on account of former years				6,937	0	0								
Total shown as revenue on account of sales under Budget Head I.				2,16,924	0	0								

Form No. 58.

FOREST DEPARTMENT, PUNJAB.

Statement showing the amount expended on the different classes of Timber and other Produce brought to Depôt during 1878-79.

Division or Depôt.	Particulars of Timber, &c.	No. of		Expenditure.			Average.			Remarks.
		Pieces.	Cubic contents.	Timber expenses under A I.	Quota of all other expenditure chargeable against timber, &c.	Total amount chargeable against timber, &c.	Amount per piece	Cubic contents per piece.	Amount per cubic foot.	
Sutlej	Deodár	1,192	15,944	1,527 0 0	13,000 0 0	14,527 0 0	12 0 0	14	0 14 0	
Do.	Pines	151	1,906	161 0 0	700 0 0	861 0 0	6 0 0	13	0 7 0	
Do.	Sál poles	2,351	...	594 0 0	287 0 0	881 0 0	0 6 0	...	...	
Beas	Deodár	256	6,362	1,382 0 0	3,290 0 0	4,672 0 0	18 0 0	25	0 11 0	
Do.	Pines	69	1,088	391 0 0	432 0 0	823 0 0	12 0 0	15	0 12 0	
Do.	Scantlings	7,417	24,593	3,546 0 0	9,570 0 0	13,116 0 0	2 0 0	3	0 7 0	
Ravi	Deodár	5,928	99,379	14,967 0 0	15,118 0 0	30,085 0 0	3 0 0	16	0 3 0	
Do.	Pines	2,771	42,725							
Do.	Scantlings	2,407	2,749	474 0 0	432 0 0	906 0 0	0 6 0	1	0 6 0	
Chenab	Deodár	8,640	140,573	11,214 0 0	24,514 0 0	36,614 0 0	1 4 0	16	0 1 0	
Do.	Pines	970	11,811	886 0 0			0 14 0	12	0 1 0	
Jhelum	Deodár	6,447	233,258	32,994 0 0	3,250 0 0	36,244 0 0	5 0 0	36	0 2 0	
Do.	Pines	414	10,981					25		
Do.	Scantlings	19,704	23,873	3,546 0 0	615 0 0	4,161 0 0	0 3 0	1	0 3 0	
	Total ...	58,717	615,244	71,682 0 0	71,208 0 0	1,42,890 0 0	...	...	...	

Form No. 60.

FOREST DEPARTMENT, PUNJAB.

Abstract showing the Value of Timber and of Live and Dead Stock for the year 1878-79.

Description of Timber and other Stock.	On hand at commencement of the year.		Received during the year.		Total.		Sold, otherwise disposed of, and lost during the year, and allowance for depreciation.		On hand at close of the year.		Cause of loss, and other particulars.
	No.	*Value.*	*No.*	*Value.*	*No.*	*Value.*	*No.*	*Value.*	*No.*	*Value.*	
		Rs.		Rs.		Rs.		Rs.		Rs.	
Timber (cubic feet)	95,596	58,444	615,661	3,58,359	711,257	4,16,803	475,508	190,156	235,749	1,42,982	Deodár valued at 10 annas a foot.
Fancy woods (number)	20	20	2,412	2,412	2,432	2,432	1,918	2,647	514	514	Pines at Rs. 5-4-0.
Broken pieces (cubic feet)	16,023	1,001	9,502	593	25,525	1,594	25,302	4,603	223	14	Scantlings at 8 annas.
Charcoal (maunds)	2,702	2,702	...	...	2,702	2,702	2,702	...	...	...	Pieces at 1 anna.
Live and Dead Stock (as per Divisional Returns)	...	1,00,161	...	7,399	...	1,07,560	...	4,651	...	1,02,909	
Total ...	114,341	1,62,328	627,575	3,68,763	741,916	5,31,091	505,430	2,02,057	236,486	2,46,419	

NOTE.—Difference in value at commencement and close of the year, Rs. 84,091.

B. H. BADEN-POWELL,
Conservator of Forests, Punjab.

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RAVI FLOOD REGISTER, 1878-79.

Date.	April.	May.	June.	July.	August.
1st	10·8	10 8	11·3	12·4	10 7
2nd	10·8	10·6	11·3	12·6	10 7
3rd	11 6	10·6	11·2	12·7	11·6 *F*
4th	11 2	11·0	11 8	12·9	12 1
5th	11 0	11·9	11 3	13·3	11·8
6th	11 0	12 4 *F*	11·4	12·7	12 5
7th	10·9	11·2	11·4	12·3	15 1 *F*
8th	10·8	11 0	11·5	12·7	11 6
9th	10·7	11·2	11·5	12·3	11·1
10th	11·8	11·4	11·6	12·1	13 1 *F*
11th	11·0	11·4	11·5	12 1	11·5
12th	14·8 *F*	11·3	11·7	12 2	11·1
13th	11·4	11·3	11·7	12·2	10 9
14th	11·3	11·1	11 6	12 4	12·4
15th	10 6	11·3	11 6	12·1	10·6
16th	10·3	11 3	11·6	11·9	10·7
17th	10 3	11 3	11·6	11 9	10 6
18th	10·4	11·1	11 8	12·1	11 2
19th	10·6	11 2	12 0	12 2	13·8 *F*
20th	10·8	11 2	12·0	12 1	11 6
21st	10 8	11·4	12·1	12·1	10·6
22nd	10·5	12 2 *F*	12·1	12·4	11·1
23rd	10 6	11·7	12·1	14·4 *F*	10 2
24th	10·5	11 3	12·2	16 2	10 1
25th	10·3	11·2	12 2	10 8	10 4
26th	10 3	11·2	12 2	11 0	10 3
27th	10·3	11·9	12·5	10·8	9·8
28th	10 7	11 3	12·2	10 6	11 8
29th	10·8	11·3	12·2	10·6	10 9
30th	10·7	11·3	12 3	10·5	13·0 *F*
31st	,,,	11·2	...	10·8	10 0

NOTE.—This is taken from the gauge at Sidhauri, one mile above the Bári Doáb Canal outlet at Mádhopur.

The zero of the gauge is 1139·42 feet above mean sea level, a little below the lowest observed point of the bed of the river (which is 1142·22 feet).

The highest flood on record occurred on 24th July 1878, when the gauge read 16·2, and the water-level was 1158·22 feet above mean sea level. Anything above 8·0 on the gauge is *above* the normal level of the river.

The readings from 1st April to 31st August are given day by day. After that date the river fell almost continuously from 9·5 on 1st September (one rise to 10·4 on the 7th) to 6·9 by 30th. During October it sank gradually and quite steadily to 5·7 on 31st. During November also, steadily, from that point to 4·9 on the 25th. A slight rise then occurred and continued till on 31st the gauge read 6·2. During the whole of January and February 1879, the reading was nearly uniform at 6·1 or 6·2. In March it began slightly to rise up to 6·3. On the 11th (suddenly) to 7·4, and to 8·0 on the 14th: then it fell, keeping between 6·5 and 6·9 to the close of the official year.

F. in the table indicates a sudden flood.

FLOOD REGISTER KEPT AT BEAS RAILWAY BRIDGE FOR 1878-79.

Rail Level 157 50 feet.

Date.	June 1878.		July 1878.		August 1878		September 1878		Remarks.
	Feet.	Inches	Feet.	Inches.	Feet.	Inches	Feet.	Inches	
1st	131	...	131	90	134	10	136	20	
2nd	130	9	131	70	134	50	133	80	
3rd	130	9	131	90	* 134	40	133	70	* 135′ 40″ noon (12 A M.)
4th	130	8	132	10	137	20	133	80	
5th	130	6	132	30	136	10	132	50	
6th	130	5	134	...	† 134	20	132	40	† 135′ 10″ do. (do.)
7th	130	5	133	90	134	40	132	50	
8th	130	6	133	30	137	30	132	70	
9th	130	8	134	50	134	30	132	80	
10th	130	8	133	40	133	80	131	80	
11th	131	6	133	80	‡ 134	80	131	60	‡ 135′ 30″ do. (do.)
12th	130	8	133	60	134	50	131	50	
13th	130	8	133	50	§ 134	50	131	50	§ 135′ 40″ do. (do.)
14th	130	10	132	90	136	50	131	60	
15th	131	...	132	60	135	80	133	80	
16th	131	...	132	30	135	...	132	...	
17th	130	10	132	...	134	70	131	40	
18th	130	9	131	90	134	40	131	20	
19th	130	11	131	80	‖ 137	20	121	10	‖ 138′ 80″ do. highest flood.
20th	130	11	132	...	138	...	131	10	
21st	131	...	132	50	134	70	131	...	
22nd	131	...	132	20	135	...	130	90	
23rd	131	3	132	20	134	...	130	90	
24th	131	5	135	20	133	30	131	...	
25th	131	6	137	...	133	50	130	70	
26th	131	8	134	20	133	60	130	40	
27th	131	8	¶ 135	90	134	...	130	20	¶ 136′ 60″ at 11 A. M.
28th	131	6	134	90	133	10	130	10	
29th	131	10	132	80	135	10	130	...	
30th	131	6	136	...	134	80	129	90	
31st	...	...	124	50	135	30	...	...	

FLOOD REGISTER OF RIVER SUTLEJ AT RUPAR DURING 1878.

Zero of Gauge 856·00.

Month and Date.		Maximum height of flood.	Remarks.
January	27	863·50	At 5 P M.
February	22	862 60	During night.
April	13	865 20	Do.
May	23	866·40	Do.
June	27	866 60	At 10 A M.
July	5	866 30	At 7 P. M.
„	9	867·05	At 4 „
„	24	869·85	At 9 A. M.
August	4	866 81	At 4 „
„	15	868·40	At 5 „
„	19	869·13	During night.
„	28	867 80	At 2 A. M.
September	1	865 73	During night.
„	15	865 38	Do.

JHELUM FLOODS REGISTER FOR THE YEAR 1878-79.

No.	Month and Date.	Height in feet.	Duration.	Remarks.
1	April 1878 ... ... 1st ...	4·30	...	Rise commenced. Readings on this date 200·30.
2	Ditto „ ... ... 13th ...	7·70	24 hours.	
3	May 1878 ... ... 1st ...	6·70	...	Reading 202·70.
4	June „ ... ... 1st ...	6·20	...	„ 202·20.
5	July „ ... ... 8th ...	8·50	24 hours ...	... Pira Ghaib island completely under water.
6	„ „ ... ... 27th ...	8·20	24 „ ...	„ 202·70 on 29th. Ditto under water.
7	August „ ... ... 4th ...	8·60	24 „ ...	„ 202·80 on 5th. Ditto completely under water.
8	„ „ ... ... 15th ...	10·20	24 „ ...	„ 203·00 on 16th. Ditto ditto ditto.
9	September „ ... ... 1st ...	4·50	...	Lowering of gauge reading commenced.

CHENAB FLOOD REGISTER, 1878-79.

Month and Date.	Part of the river affected.	Duration.	Remarks.
April 1878 ... 11th	Whole river ...	About 12 hours	Heavy rains in the vicinity. River rose 6·2 feet.
May „ ... 6th	Ditto ...	„ 10 „	Heavy rains. River rose 5 feet. Was at its maximum at 10 on night of 5th, when it measured 12 feet.
July „ ... 24th	Ditto ...	„ 6 „	Height 16·2. On morning of 23rd the river was 14·1, so that it may be said to have risen 2·1 feet.
August „ ... 10th	Ditto ...	„ 10 „	Height 18·5, the highest rise this year—in fact the highest since 1873. Rose 4·5 feet in a few hours. Rain in the hills.
September „ ... 26th	Ditto ...	Ditto	River rose 3 feet.

SUPPLEMENTARY NOTE TO FLOOD REGISTER.

Chenab Division.

It is a curious fact that the River Chenab is getting lower and lower every year. In 1873-74 its minimum of low water mark was 2·8 ; in 1874-75 it came down to 2·4 ; and in 1875-76 it was found to be 1·4. The winter level of 1876-77 was ·9, and the lowest point observed in 1877-78, 1·7, but this is probably owing to the winter rains, which in 1877-78 were unusually heavy.

This year, 1878-79, the river has gone down to ·6 *below zero* of gauge. There is also a corresponding difference in the frequency and suddenness of monsoon freshets, and although not so great, the difference is nevertheless perceptible ;—for instance, in 1873-74 there were six freshets of and above two feet in height ; 1874-75 had seven ; 1875-76 eleven ; 1876-77 had also eleven ; and 1877-78 twelve ; 1878-79 has, owing to the droughty season, only had nine. This year is also remarkable for the highest flood on record since September 1873. It occurred on the night of 10th August, and after rising 4½ feet went down without doing much harm. The reduced maximum level of this flood read 18·5, and although it is the highest point the river has attained for some years past, it is not the highest rise of the season. A flood occurring in April rose 6·2 feet ; but, as this happened when the river was low, it did not reach such a height ; another flood, somewhat out of date, occurred on 6th May, which rose 5 feet ; and two others taking place in subsequent months form the sum total of this year's floods.

Proceedings of the Hon'ble the Lieutenant-Governor of the Punjab, in the Revenue, Agriculture and Commerce Department (Forests), No. 493F., dated 18th November 1879.

READ—

The report of the Conservator of Forests on the Arboriculture of the Punjab for 1878-79.

RESOLUTION.—The reports of certain districts and canals were submitted very late to the Conservator, who was thus prevented from compiling the provincial report at an early date. The Lieutenant-Governor desires that all Commissioners will take care that, for the future, the district returns are submitted punctually so as to reach the Conservator by 15th June at the latest.

2. For the future, the form of the district reports will be that of which an example filled up is given by Mr. Powell in paragraphs 2 and 3 of his report. By making this return of the same form exactly as the provincial one, a great deal of trouble in compilation of the latter may be avoided.

3. In submitting the next yearly return, all District Officers should be careful to carry out the suggestions of the Conservator on these points exactly.

4. The proposal that Native Overseers should be sent to the Changa Manga plantation to acquire a rough knowledge of practical arboriculture commends itself to the Lieutenant-Governor, and the suggestion may well be urged on the attention of District Committees by the District Officers. By this method a number of Supervisors with a sufficient knowledge of the subject to avoid at least all unprofitable experiments may be obtained at a very small cost.

5. The Lieutenant-Governor considers that the subject of district arboriculture is one of the greatest importance to the prosperity of the country and the convenience of the public, and if the matter is carefully managed, it will almost everywhere return a considerable profit on the outlay made. The suggestions and remarks of the Conservator are of the greatest value for the guidance of District Officers, and the Lieutenant-Governor desires that the Commissioners of Divisions will see that his recommendations are carefully observed in all districts.

6. The Conservator of Forests took up this subject a few years ago at the special request of Government, and has devoted much attention to it, which, the Lieutenant-Governor trusts, will produce good results if the attention of the district authorities is properly given to the matter. His Honor desires to convey his acknowledgments to Mr. Powell for his valuable and suggestive report.

ORDER.—Ordered that the above Resolution be printed and published in the *Punjab Gazette*, and that copies be forwarded to the Financial Commissioner, Irrigation Department, Public Works Department, all Commissioners and Deputy Commissioners, and separate copies to all first class Municipalities and District Committees, for information and guidance.

By order of the Hon'ble the Lieutenant-Governor of the Punjab,

LEPEL GRIFFIN,

Secretary to Government, Punjab.

Printed at the Punjab Government Civil Secretariat Press, Lahore,—27-11-79.—750.

DISTRICT AND CANAL ARBORICULTURE REPORT, 1878-79.

1. It is unfortunate that a report on Arboriculture for the official year 1878 should appear in September 1879, but I feel that an apology is hardly called for in this office, seeing that I have no means of altering the fact, that local reports are sent to me most irregularly, in spite of an early reminder to all districts issued in the hope that it would be possible to submit this report as an appendix to the Forest Administration Report, which was submitted in the print more than two months ago.

2. The districts of Hazára, Kohát, Bannu and Dera Ismail Khan have sent no reports at all. Indeed this is usually the case.

The canal reports have been all received, with the exception of the 1st Division Bári Doáb canal.

Recommendations to districts.

3. I have added to each district (where needed) a specific paragraph margined "recommendations," as the remarks suggested by the local report.

4. Some general remarks are suggested by the perusal of the local report.

Pruning and lopping should be restricted as much as possible. Skilled supervision is not attainable as a rule; therefore it is certain that all lopping and pruning that can be possibly avoided should be so, and no temptation to get a little revenue by lopping should be given way to.

Pruning and lopping should be restricted.

If revenue of this kind is wanted, it is far better to plant close and thin. Close planting will draw up the trees, and so get their heads out of the way of cart traffic, &c. It will also prevent blanks, since if a tree fails here and there it is of no consequence. The poles that come out of an avenue thinned the 3rd or 4th year (according to growth) will usually be saleable for native house building; in any case they will furnish material for fencing.

5. Never remove very large branches, rather cut off a few feet at the end, and so shorten them. Wherever a branch is broken, or wherever a branch has to be cut, cut it close to the stem. *Never* leave a stump 2 feet or so long. Always cut from below first, and then downwards, so that the weight of the branch does not tear down a strip of bark, but comes clear away.

The season of pruning is not easy to determine. It must be done at a time when the growth of the tree is vigorous, so that the wounds may close over quickly; it must not be done when the sap is in full flow, or the wound will "bleed" profusely. As inspection is much more likely to follow, I should recommend autumn.

6. It should always be noted what *income* of any kind has been realized to set off against the cost of operation. Some districts have suggested that there is some income, but have not stated it.

Income to be noted.

Fencing.

7. The subject of fencing, whether round each tree or in a line continuously, should be noted; the form of fence and the cost are both useful to note, as affording a hint to other districts.

Contents of reports.

8. The year's operations on the whole show an improvement in method, and nearly all the reports are very much more satisfactory than any that have preceded them.

Establishments.

9. A very great diversity of practice, and still greater diversity as regards the amount spent, appears under the head of establishment.

It may be suggested that this subject should receive consideration in each district.

One plan appears to be to have a fairly well paid "darogah," or head man over the whole, and a number of jamadárs and peons, or "guards" to watch the groves, plantations, gardens and avenues.

In other places the tahsíl establishments supervise, and there are gardeners, with assistant coolies and bhistis permanently entertained.

In many districts no regular men are kept on, but gardeners, coolies and bhistís are entertained as occasion requires as "daily labor."

Whether one "daroga" can really inspect each tahsíl's work is a matter I cannot decide, but if such a man is kept, or if a special man in each tahsíl is kept, I would suggest their being sent for 6 months or so to Chánga Mánga to be taught. I strongly urge the *permanent* organization of a sufficient number of "gardeners" or "tree-planters," who should know their work, and get familiar with local methods of planting. This establishment should be reasonable, and should supervise all work being done under their orders by daily labor. To each gardener one assistant on smaller pay might be allowed.

10. The arboriculture statements are not yet quite as uniform as might be wished. They ought not to be bulky, and I think that, to diminish labor, instead of giving a list of roads, I would simply give tahsíl totals of roads, and then specify localities of groves, gardens or plantations, where possible.

Statements not yet uniformly prepared

11. In order to simplify the returns and to reduce the labor of preparation, I propose in future to *drop the three columns* "success" "partial success" and "failure," and simply to use one column for "going over or replenishing previous," and one for "new work." The amount of success is then briefly noted opposite the work in the column of remarks. Thus, "of gaps filled on 4 miles about 50 per cent. succeeded," or "gaps filled on 2 miles, all but a few died owing to drought, &c., &c."

Proposed simplification.

12. I have drawn up and appended to this report, once more, a sample statement (the names and facts being of course imaginary), and I think that each district will have no difficultty in giving its return *uniformly* in this shape.

13. May I once again point out the *absolute* uselessness of alluding generally to *eucalyptus;* the *second* name is the important one; and too great care cannot be used in labelling pots, seed, beds and young plants. There are 160 eucalypti inhabiting every style of climate, from snowy mountains to dry and arid plains. If one species *succeeds*, and we do not know which of the 160 it is (and we can only do this by having the *second* name), how can we ever extend the cultivation, or apply for the proper seed?

Cultivation of eucalyptus.

(PATTERN.)

SIALKOT DISTRICT.

Tahsil.	Serial No.	Locality or name of road.	No. of miles still unplanted or planted but failed altogether.	Work of previous year which still requires completion.	*Work of the year under report.*		Remarks.
					Going over or completing old work.	New work.	
Zafarwál—dry—rain-fall 20·5′	1	Length of road to be operated on during year, 16 miles.	...	The whole to be replenished.	8 miles	...	Shisham trees all died on one mile from drought.
				I.—Roads.			
Pasrúr ...	2	Do. 108 miles	7	108 miles, a few blanks only.	108 miles	4 miles	The new work was with pípal seedlings, and bór cuttings; the latter on 2 miles failed to strike.
				II.—Groves and Gardens.			
Do. ...	3	8 groves or groups of trees.	about 16 acres.	In all some trees existed but room for extension.	700 trees	...	Chiefly mango added at the tahsil, on 3 groves, on encamping grounds, on the main road to Amritsar, the school-house, the dispensary and the police rest-house.
	4	Plantation ...	25 acres.	Blank.	...	25 acres.	A plot of waste land near the Amritsar road was taken in hand, ploughed in lines, 2 feet broad at 16 feet apart, and sown with kikar and phulâhi in alternate lines in the begining of the rains, has come up well, as at date of report (16 June 1879) the seedlings were sufficient to cover the area; success may be reported.

N. B.—(Detail of roads not wanted—only totals of length, any road of particular inportance or treated in a moral or interesting manner, may be noted in the "remarks" or in the narrative).

NARRATIVE NOTE.

The method of work was entirely by transplants one year old (about 3 feet high), except where 4 feet bór cuttings were used.

A central nursery for each tahsil is maintained, and several temporary ones at convenient sites on the Amritsar road.

In the Siálkot station garden, besides a nursery for trees, fruit trees of superior kinds are cultivated. In 1871, 4 European (French) olive trees were received. They were planted out in rich soil, and have since been pruned and manured. They are now 20 feet high and 18 inches in girth. They fruited, one tree abundantly this year, and the other sparsely. 203 oranges and 50 fig trees, 20 palm and 30 Palampur peaches were sold at cost price, and in some cases given to zamíndárs.

Expenditure amounted to Rs. 4,000, thus—

Establishment.			Rs.		
1 Darogah	...	...	25		
1 Jamadár	...	...	7		
4 Peons	...	...	5		
1 Gardener	...	...	7	Rs.	576
1 Do. assistant	...	...	4		
		Total	48		
Cost of 155 bhistis and 104 coolies	...	...		„	2,500
Carriage of plants	...	...		„	204
Cost of bullocks	...	...		„	500
Contingencies	...	...		„	220
		Total Rs.			4,000

Young trees are fenced, either with thorns, which cost nothing, or mud palisades which cost 6 annas each, wooden crates in the station cost 12 annas each, being made out of thinnings.

Lopping only when necessary is executed with a saw and English knives.

PESHAWAR DISTRICT.

14. This district is classed as dry, the rain-fall being—

Peshawar	...	...	20·7	inches
Mardán	...	...	24·9	„
Hashtnágar	...	...	19·8	„
Doaba Daúdzai	...	...	21·0	„

It is found that March (for spring work) and August (for rain work) are the best months for transplanting. In a district so far north, March, which would be very late in other places, is probably very well suited. The object in all early spring transplanting, is to get the trees well settled *before* the spring growth begins, so as to give the plants the full benefit of it.

15. The trees found to succeed best for groves and road-side work are the shisham, the mulberry, the sirin (*acacia lebbek*,—I presume the common tree, not the white or "Doon," siris is intended), the babul (*acacia vera*) and the willow. The "gaz*" (probably the *tamarix articulata*) has been also used. Efforts have been made to grow the kikar (*acacia Arabica*), but I think that though this may be successful as a curiosity, it will be found that Peshawar is too far north.

Gujrat and Jhelum are the limits of its successful growth, speaking generally.

Expenditure.

16. The expenditure was as follows;—

1 Jamadár	@ Rs. 12 and 4 @ Rs. 10	...	...	Rs.	624
3 Malís	@ „ 9, 8 & 7 each	...	...	„	288
4 Do.	@ „ 6 ...	...	...	„	288
91 Coolies	@ „ 5 (for 11 months)	...	...	„	5,005
Temporary Malís	„ ...	...	...	„	44
95 Coolies	@ „ 5 (for one month)...	...	...	„	475
Nurseries	... ...	...	...	„	243
Wells	... ...	...	...	„	160
Water-courses for do.	... ...	...	...	„	148
		Total	...		7,275

The expenditure reported last year was Rs. 11,300.

The establishment has been reduced.

Summary of operations.

17. The usual table of work accompanies, and is summarized in the table at the end, which is intended to give the totals as far as possible of the whole Province.

Recommendations.

18. It may generally be observed that the plan is a good one always to *complete* and have done with, one road or one section of a road before beginning a new one.

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* NOTE. "Ghaz" or Ghaziet is given by Brandis as a name for the smaller tamarisk—*T. dioica*. I would not cultivate this small species,—the large tamarisk or farash of the plains is the only one worth planting.

Pruning it is said is done in August. I take this opportunity most strongly to recommend this being done as little as possible, and especially that no *mulberry** tree be ever pruned at all; unless to remove a branch broken by accident. Bad pruning of all trees is sure to end in a decayed stem, but of mulberry trees before all.

The Jhil plantation.

19. The Jhil plantation had an income as follows:—

Balance on 1st April	...	Rs 912
Grant on indent from Imperial Forest Budget ...	...	„ 1,136
Total	...	Rs. 2,048

And the expenditure was—

Establishment.—

1 Jamadár @	...	Rs. 10	Rs. 696
1 Malí @	...	„ 8	
8 Coolies @	...	„ 5	
Excavation of drain cuts	...		„ 700
Huts for gardeners	...		„ 100
Cost of "massaks"	...		„ 21
		Total	Rs. 1,517

The Revenue from grass sales was Rs. 1,458-8-6.

The work on the plantation.

20. I have during the year fully explained what is wanted, and promised the visit of a Forest Officer in spring next when work can go on. But this Jhil plantation never can be finished, and never can be successful, till the drainage is complete, and this involves the definite settlement of certain disputes with the neighbouring land-owners. This has been explained in great detail to the local authorities, and I pointed out that it will be of no sort of use sending a Forest Officer there until this point is settled, being one with which a Forest Officer has no power to deal. I have not been favoured with any reply to my letter.

21 The plantation has been finished as far as it is at present possible, which simply means that all the compartments not yet drained, in consequence of the disputes alluded to, have failed, and of course will continue to be failures till the drainage is carried out by the settlement of the disputes.

HAZARA
KOHAT
DERA ISMAIL KHAN
BANNU
No report.

DERA GHAZI KHAN DISTRICT.

21. The work has been properly confined to a few places. I make no apology for repeating this remark; it is the secret of economical success—undertake a small extent of work and finish it "out and out" before going on to another piece.

Destruction by floods.

22. The terrible floods of last year did so much damage that every thing attempted in the year under report has been in the way of restoration. Mr. Fryer says that it will take two or three years to complete this restoration.

Summary of work.

23. The road planting may be summarized here as showing what the floods did. From Dera Gházi Khan to Rájanpur, 14 miles have been planted (leaving 18 still untouched), and of the 14, 6 miles were during the year replenished with partial success.

From Dera Ghàzi Khan to Dera Ismail Khan (129 miles), 3 miles were planted, of which 2 were replenished.

From Dera Gházi Khan to Sheru (22 miles), 5 miles have been planted, of which 2 were replenished.

From Dera Gházi Khan to Mirhetta (9 miles) 1 mile had been planted and was destroyed by the long remaining flood water; it was replenished during the year.

Rájanpur to Mithankot (11 miles), 6 miles were replenished.

Do. to Jampur (40 miles) 6 miles partly planted, of this 4 miles replenished.

Three nurseries on the Dera Ghàzi Khan to Rájanpur road destroyed by floods were re-established.

A nursery on the Sheru road escaped the floods, and was increased by 1,000 trees.

Another nursery on the Sakhi Sarwar road escaped also, and was similarly increased.

One on the Dera Ismail Khan road was completely destroyed, and was re-stocked.

*Their growth in this district is celebrated.

A fuel plantation started in the "Kotla Sikhani" rakh was destroyed; 20 acres have been re-sown with shīsham and mango trees interspersed in clumps. The plantation at present is in two plots.

Expenditure. 24. The expenditure was Rs. 4,423; road-side trees are watered by bhistís; 32 of whom are entertained.

The plantations are maintained by wells, of which there are now 3, and 4 pairs of bullocks.

There were 6 nurseries along the different roads (3 being on the Rájanpur road) for the supply of trees. This is as it should be.

RAWALPINDI DISTRICT.

25. No special establishment is maintained. The tahísl officials and lambardárs superintend the work, and only laborers and bhistis are hired to do the work.

The expenditure is not stated. It is noted that it was Rs. 806 less than last year, but last year no report was sent.

Rain-fall failed 26. The rain-fall being deficient, less work was done, and the success was not great.

Trees planted too far apart. 27. The trees were planted at 30 feet. In my opinion this is very much too far. In a district dependent on rain, I would never plant further than 10 feet. Thinnings carried out the 3rd or 4th year (or even later according to growth) will sell as poles, and the regular revenue thus obtained will amply repay the greater initial labor and cost. If one tree fails, in a row at 30 feet apart, you get 60 feet blank. Shisham was the only species used. But most of the work of the year failed for want of rain.

28. The work is of the usual character. In the Kahuta tahsíl the large number of fourteen different roads received attention, and 125 trees (of what sort should always in such a case be stated) were added to the Government *garden*, of which half failed.

Recommendations. 29. I recommend that in this district the work should be confined to a smaller number of places; that old work should be completed and blanks filled in before new work is taken up. When gardens and groves are made, I would mention the species. The statement of arboriculture, also, is not quite correct, for the *length* of road newly taken up is not stated. Thus, taking an example at random, the road (Fátahjang) from Kalipairi to Chakri is 16 miles long; of this 11 miles have been planted, but not completely so, and 5 miles have not been touched as yet; the return shows that nothing was done on the 11 miles, but that on the 5 miles, 459 trees were planted (on one mile, or two, or what?) In "remarks" I should say briefly—"all shisham trees planted at 30 feet apart, failure due partly to bad soil, partly to failure of rain."

I may here repeat my recommendation to reduce the distance of planting, and to keep up *nurseries* to supply the localities of work easily with strong good trees.

JHELUM DISTRICT.

Summary of work. 30. In the Jhelum tahsíl 20 miles of the Grand Trunk Road have been planted.

In Pind Dádan Khan tahsíl 61 miles have been planted, but not completely; 36 miles remained to be done. The work consisted of planting, both on blanks and on new extension, a large number of trees.

A tank was also planted.

A few trees were plant out in *Chakwál* Tahsíl, and in that of Talagang. A tank was planted up and some 13½ miles of road worked on partly replenishing and partly new work.

No detail of expenditure, &c., is given. 31. A memo. of remarks promised (12th August) has not been received. No data of expenditure are given.

Recommendations. 32. I would invite the Deputy Commissioner's attention to the fact that the table as prepared does not show the real results. The columns when dealing with lines of road are not intended to be filled with number of trees (except as an added remark, which is very proper).

The late date of this report and its incompleteness in this interesting district is much to be regretted.

GUJRAT DISTRICT.

Summary of work. 33. As reported last year, so this, no new work has been done, with the exception that 1½ miles of the new road from the Grand Trunk Road to the Railway Station were planted; about half the distance being "success" and half only partial. This included fencing.

In the Gujrát tahsíl only was any work done, and in 7 miles of road withered trees were replaced and fences restored.

34. The expenditure was Rs. 1,530, the establishment being the same as last year.

Recommendations.

35. I would recommend that in this district more work should be done; the old system of sowing kikar (where the soil is light, in trenches along the road that in former years produced such good results) might be tried again. It answers only where the soil is *light*, the seed being put in with the first rain.

It is always interesting to know what kind of *fencing* is found cheapest and most successful, and whether each tree is fenced or a continuous hedge or fence adopted.

None of the tahsíls except the Sadr appear to have any nursery for the supply of young trees.

SHAHPUR DISTRICT.

Summary of work

36. This is a dry district, Shahpur having 21·4 inches (which I should suspect to be an extreme measurement), Khushab tahsíl having 13½ and Bhera 11 inches.

In the Shahpur tahsíl two new roads (7 miles) were taken in hand, and 4 miles stocked with partial success. As only 1,000 trees were taken to the new 4 miles, that is 125 trees for each side per mile (all of which did not succeed), the blanks must be very large.

Expenditure.

37. The expenditure was Rs. 2,377. The establishment has been the same as reported last year, and 80 were spent on cattle, 9 pairs of bullocks and one buffalo being kept.

Nurseries are kept up at convenient places. They are sown in the rains, and the transplants taken out in the following rains.

Shisham, pipal, bor, kachnár, carob bean, and mulberry are used, and kikar is said to be "planted,"—probably sown is meant.

Recommendations.

38. If kikar is ever *transplanted*, this interesting fact might be noted, as it is usually said that kikar is very difficult to transplant, though it *can* be done.

Information regarding the carob tree valuable.

I would also recommend closer planting than would seem to be usually adopted—10 feet apart and even 7 feet where economy of water is necessary and failures are apprehended—is what I think best. Where a special tree like the carob is grown, information as to its success, what soil it likes, how cultivated, whether it fruits, whether indigenous seed is used or foreign seed, &c., should be stated. The Government have taken great interest in the introduction of the carob tree, and in the Forest Department experiments are being made; information therefore about this tree, and the number of trees in the different tahsíls, and where they are to be found, would be very valuable.

Pruning and lopping.

I would also beg the Deputy Commissioner to curtail the pruning and lopping.

GUJRANWALA DISTRICT.

Summary of work.

39. The district varies from "dry" (25 inches at Gujránwála, and 27 Hafizabad) to "medium" (34 inches, Wazírabad).

The work is shown in the appended table. The new work consisted of a part of the road to Ramnagar from Wazírabad, planted with siris and shisham. The road to Dhonkal, much frequented (as a well-known fair is held at Dhonkal) was also newly taken in hand. The first mile succeeded, the second partially so.

In *Hafizabad* tahsíl the soil is poor, dry and salt; nevertheless eight different roads were taken in hand, all for replenishing old work, which is chiefly on the 1st mile away from the tahsíl in each case.

Wells are not used for watering, but trees are supported till able to take care of themselves by hand watering (bhistis).

Expenditure.

40. The establishment (not reported last year) may now be indicated:—

2 Jamadárs @ Rs. 10
7 Watchers (for 6 months only) @ Rs. 5.
1 Gardener @ Rs. 6.
73 Bhistis (for 6 months) @ Rs. 4.

This is for the Gujránwála tahsíl; here also a watcher and four bhistis are kept for the station planting. Each of the other tahsíls has one watcher and from six to nine bhistis.

The whole expenditure was Rs. 3,070, and Rs. 60 was realized from sale of thinnings and loppings.

Extract from Local Report (Nurseries).

41. The following remarks from the report must be quoted:—

"The district was far behind in having nurseries, and could not boast of having any, so in the year 1877-78 a strong attempt was made by the district Committee to supply this deficiency.

"Small nurseries were established at intervals of from two to five miles along the roads in sites having advantages of well water and of careful cultivation and supervision.

Method of providing for maintenance.

"The Committee supplied the seeds and paid Government demand, &c., on the plots taken up for nurseries. The nurseries were then left in the hand of cultivators without any further immediate payment, but with a promise of reward proportioned to the results of his care and tending; and honors were also promised to such zaildárs and lambardárs who should make themselves conspicuous by evincing active zeal and interest in the subject.

"The result of the experiment was a most satisfactory one, and one that could not have been hoped for but for the above consideration.

"Most of the nurseries flourished splendidly, and in February and March the Committee was able to plant from the supplies of these nurseries, at a very little cost, 40 or 50 miles of roads.

"The experiment is well worth repeating, and it may be hoped that by extending similar operations we will be able to provide all the main lines of communication with shady and splendid trees."

Method of working.

42. All work is done by transplanting, from nurseries, trees of one year old (directly from the seed bed, no second planting in the nursery being given). The trees are fenced with thorns and established by bhistis watering; shisham, siris, and kikar are used.

I presume (see Shahpur district) that kikar is not raised in nurseries for transplanting; if it is, this fact, as of interest, should be noted.

Transplanting is done both in winter and in the rains.

Lopping.

43. It is satisfactory to note that pruning, where necessary, is done by the saw, and not by the rough "dránti" or a blunt hatchet.

Recommendations.

44. This report is very satisfactory. I should be inclined to restrict the work to fewer roads, even than at present, in Háfizabad, and try the system of raising *farásh in trenches*; both cuttings and seed can be used.

LAHORE DISTRICT.

Summary of work.

45. Major Harcourt has explained the circumstances which hindered the development of his plans for arboriculture during the year, but there is no doubt that this subject is well cared for. As an excellent beginning, a definite plan was arranged for each tahsíl, taking up the roads, sites of planting, &c, in detail according to the order of their importance, and instructing that each mile should be finished before another mile was touched. This method of working, if adhered to, will prove the key to economy and to success.

Some progress, however, was made. It is reported that the towns of Kasúr, Chúnian and Sharakpur, now possess large and handsome gardens, which serve also as nurseries from which young trees are supplied for avenue planting.

The bazár at Anárkali is being planted, so that in time it will be completely shaded.

In the capital, various station roads were replenished. The other work is shown in the table appended.

Recommendations.

46. I have only to suggest regarding this report, that at *Lahore* itself, wherever a tree is put in, a fence should be given, or the destruction of the tree by cattle, &c., is certain. I have noticed holes in parts of Lahore, which I am sure have been, since my acquaintance with the station, filled again and again, perhaps a dozen times, each tree being browsed down.

Expenditure and income should be stated.

FEROZEPORE DISTRICT.

47. I beg to point out that it is not stated what sort of rain-fall the district has.

Summary of work.

The work here may be summarized here, as I cannot include it sufficiently in the general table.

Thirteen different roads leading from the city or cantonment were treated; a few miles of each were replenished, some miles being only partially successful; the tabular statement is not intelligible, however, on this head.

On most of the roads *new* work (*i. e.*, on the unplanted portions) was attempted, but cannot be made out, *e. g.*, on the road from the city to Makhú (11½ miles) it is said that on the first to tenth mile 91 trees were planted; that is about ten trees to a mile, and that this was only partially successful.

Three roads in Mogah, three in Zirah and six in Muktsar were treated. The work in Mogah and Zirah may be new work.

In Zira the work apparently was on the road from Kot Isa Khan to Data (six miles treated); 26,450 trees were planted, of which 24,200 failed. This would give less than a foot apart, and perhaps this refers to *farásh cuttings*, which might have been put in in great quantities, and the work must have been very badly done.

Groves also formed a feature in the work. Seven groves in the Ferozepore tahsíl, two in Moga, and three in Zira, were new works, the area not being stated; ten existing groves in Muktsar were both extended and replenished.

Expenditure.

48. The expenditure was Rs. 4,911, and no income of any kind is mentioned.

Recommendations.

49. It is stated in this district that farásh cuttings put in in February are the most used. I should have thought that where these depended on rain or bhistis, cuttings put in at the beginning of what rainy season there is, would have succeeded. I would also recommend the system of cutting long narrow trenches about two feet or 18 inches deep, and two feet wide, and either sowing farásh seed or planting cuttings at the bottom; the large number of failures would seem to show that the cuttings are not properly made.

It is presumed that where canal water is available, other trees are grown.

Where groves are made, a nursery with a well is established, and the grove is then formed by transplants. Sometimes inundation canal is available; sometimes hand watering is resorted to.

I would recommend that this district work should be restricted to fewer places. It seems far too many places are attempted at once.

MONTGOMERY DISTRICT.

Summary of work.

50. The statement is not prepared quite correctly. One road in Dipálpur tahsíl and one in Pákpattan were treated; only one mile of the latter and six miles of the former had been planted (as should have been stated in column 5), and the attempt to fill blanks resulted in failure.

In the station of Montgomery 6,993 trees were planted in gardens at dák bungalow, church, &c., where trees were already existing to a certain extent, and 1,661 trees were planted in new places.

Some trees were planted at the Chichawatni dák bungalow, and 1,916 trees were added to the Dipálpur tahsíl garden. A grove was made at Gugaira, and 5,318 trees planted out in the tahsíl at different places.

Paying for the maintenance of trees.

51. The plan noted in last report of paying zamíndárs Rs. 2 per 100 trees to water and keep them alive cannot be judged of, for the year past, as only Rs. 50 were paid under this head; but the Pákpattan Tahsíldár had not sent in his accounts, and this is the chief tahsíl in which the system is worked.

Expenditure.

52. The establishment (bhistis and water-contractors) cost Rs. 334, and was less than last year apparently, thus—

1 Water-contractor at Chichawatni	...	@ Rs.	10
1 Do. on the Pákpattan Road	...	@ „	4
1 Bhistí at Okára ...	...	@ „	5
1 Do. at Dipálpur ...	...	@ „	5
Gardener and coolie at Gugaira (employed from November only) ...	...	@ „	9
Total per mensem		Rs.	33

The expenditure was—			
Establishment	...	Rs. 334	
Contingencies—Feed of bullocks, &c.	...	„ 500	
Nurseries	...	„ 225	
Carriage of plants	...	„ 201	
Miscellaneous	...	„ 36	1,052
	Total Rs.		1,386

The cost of the bullocks is chiefly for the station of Montgomery. The cost of watering trees by zamíndárs is not included in the above.

Recommendations.

53. It is not known what species succeed best in this district, for it is said that this was reported last year, but I do not find any allusion to the subject.

It is also added that lopping and thinning are "attended" to. I hope, in this dry district, that this means the former is not allowed at all.

Thorns are used as fences only.

MOOLTAN DISTRICT.

Summary of work.

54. On roads no new work was done; but several avenues were replenished, as shown in the table.

Groves.

Seedlings of *kikar*, shisham, and siris, were put out in the existing groves of the Lodhrán and Serai Sidhu tahsíl compounds, about 2,000 being successful in each, as the former is 1½ acre, and the latter ½ an acre. The one must be well, the other thickly stocked, as 4,840 trees to an acre would be planted at a distance of 3 × 3, and 1,210 trees to an acre would be at 6 × 6.

One other grove at Jalálpur thána (of ½ an acre) was also stocked successfully with 1,000 seedlings.

Nurseries.

Nurseries were re-stocked at Lodhrán, Serai Sidhu, and Jalálpur; it is hoped that these are not the groves mentioned above, because groves are permanently planted, whereas nurseries are quite a different thing, and are intended to supply young trees which are constantly removed.

Expenditure.

55. The expenditure was as follows:—

Establishment—

2 Jamadars	}	Rs.	1,364
16 Malís (including feed of bullocks) ...			
Labor in planting and watering ...		„	1,000
	Total	Rs.	2,364

Recommendations.

56. It is satisfactory to notice that "bor" and "pipal" cuttings are largely used. It will be found, however, that *natural* seedlings of these trees taken up from near old trees with great care will make splendid growth, especially pipal cuttings, which are not nearly so easy to raise as bor.

I beg to call attention to the remarks about nurseries as distinct from groves.

Are *kikar* really *transplanted* from nurseries?

I would also recommend the cultivation of mango trees wherever possible.

It is stated that *lopping* commences in November, and *continues* (let us hope not) till February.

Circular mud walls are found to be the best fence for trees (used for each tree separately).

JHANG DISTRICT.

Method of working.

57. The work in this dry district (9 to 12 inches) can only be maintained by wells, and I do not understand that any attempt is made (as in Ferozepore, Montgomery, and other dry places) to use bhistis for hand-watering.

There are 15 "arboricultural" wells belonging to Government, and 56 belonging to private persons but used to water roadside plantations, remuneration being given for this use; 16 pairs of bullocks are kept up.

Expenditure.

58. An establishment of 40 men at different rates of pay cost Rs. 2,430 a year; so that the expenditure is thus summarized:—

Establishment ...	...	...	Rs.	2,430
Feed of cattle ...	...	...	„	270
Labor, &c. ...	...	...	„	300
		Total	Rs.	3,000

Income.

59. An income of Rs. 27 was obtained from lopping.

Summary of work.

60. The work consisted in replenishing the nursery at the Sadr was 7,379 trees, and also filling up 300 trees in the nursery attached to the tahsíl garden at Shorkot. These nurseries supply apparently all the trees that are put out in roads throughout the district.

In the Jhang tahsíl, the road from the Sadr to Shahpur district boundary, to Kharora, and to the Chiniot Road to Khaki Shah, to Trimmu to Lahore, were all treated, one or two miles on each being replenished with success.

In Chiniot, the road from Jhang had one mile replenished. There is a garden of five acres at the tahsíl to which nothing was added during the year.

In Shorkot (which is better off for moisture, having 19·4 inches) two miles on the road from Jhang were replenished.

There are in this district certain 'chaks' or plantations. That at Sajowal (24 acres) is said to contain 61,493 trees (of what species?). At Chakalyána there is a plot of 64 acres.

The Chak Chiniot was carried away entirely by the Chenab river.

MUZAFFARGARH DISTRICT.

61. Also a dry district (rain-fall 11 inches), although near the river shisham trees attain a fine development.

Summary of work.

In the Muzaffargarh tahsíl, a mile of *double* avenue from Ganeshwah bridge to the Telehri garden was completed. Other work is summarized in the table.

To the Telehri garden (26 acres) 110 fruit trees (mangoes, oranges, figs,) were added with success, only five dying from frost.

Expenditure.

62. The expenditure is given as Rs. 2,929.

The permanent staff is separately shown for *road* work, as —

1	Jamadár	@	Rs. 7-0-0 per month
4	Gardeners	@	„ 5-0-0 „
20	Bhistis	@	„ 57-8-0 „

20 Bullocks were maintained at a cost of Rs. 541.

While for groves, 7 Mális costing Rs. 30 per mensem, 6 Bhistis at Rs. 22, are separately maintained. Two bullocks worked a well, and their keep cost Rs. 68 a year; a pump was also brought from Lahore, costing Rs. 47.

Establishment	for roads	...	...	...	Rs.	1,014
Do.	for groves	...	...	...	„	624
Keep of cattle	...	...	...	...	„	609
A pumps	...	...	...	...	„	47
				Total	Rs.	2,294

Method of working.

63. Young trees are supplied from the Telehri garden nursery and the nurseries on the Khangarh Road.

Transplanting is done only during the rainy season (July and August); transplants 6′ to 7′ high are preferred.

No lopping done.

64. It is satisfactory to observe (for the first time as yet) that no trees were lopped during the year. Fencing by hedges and "thánlahs" is practised always.

SIALKOT DISTRICT.

65. Though a fairly-watered district in average years, the want of rain in 1877 and 1878 determined the authorities against attempting new work, and they confined attention to maintaining existing trees and replenishing. This will be seen summarised in the table.

Summary of work.

Nurseries.

66. A new nursery was started in Pasrúr (Dodhá on the Amritsar road) and seed sown; 100 trees (the sort might have been mentioned) were planted in the tahsíl garden; and 40 trees planted at the ground where the Gulu Shah Fair is held.

The Talwandi nursery was extended by sowings. There are now four nurseries in the district for supplying avenue and other trees.

67. It is worthy of remark that the four European olives in the Siálkot garden bore fruit this year. The garden is a large one (27 acres), stocked with choice trees, fruit and other. Part is used for a nursery to supply trees, and it has been most useful as a centre of distribution, with a view to encouraging zamindárs to cultivate valuable trees for themselves.

Fruiting of the European olive.

Expenditure.

68. The total expenditure is thus summarized;—

1	Supervisor @ Rs. 20	...	Rs.	240
5	Jamadárs (4 months)	...	„	208
12	Chaprassís (4 months)	...	„	279
16	Mális and 51 bhistis	...	„	1,838
			Rs.	2,565
	Contingencies	...	„	135
		Total	Rs.	2,700

69. The Jamadárs and Chaprasís were found to be useless (as indeed might be expected), and were discharged. The plan of having one or more head-men, if they know anything about sowing, planting, lopping, &c., is a good one, and perhaps a few permanent and *fairly paid* Jamadárs to keep people up to their work would be the best form of fixed establishment, in addition to gardeners.

Local remarks as to establishment.

70. An income of Rs. 972 from lopping is reported, and I would beg for consideration (if this is really from lopping, not from thinning out of closely-planted trees) of the great mischief that must be done by it.

Income.

71. An experiment was made of sowing shisham and siris broadcast, on the berms of district roads, where space permitted. I would suggest as an improvement on this, sowing these species and kikar wherever the soil is light (*i. e.*, has a fair proportion of sand and does not 'cake') *in trenches*, 12 inches deep, the soil from the trench being pulverized, and part of it put back in the trench, the rest being left on one side. Sow in the trench just before the rains set in.

Experiment.

72. Colonel Birch is going to try the Eucalyptus in Baijwat; no doubt it will succeed, but there are 160 Eucalypti, so that it is *absolutely* necessary to note the second name. I recommend *Resinifera saligna, Rostrata*, and possibly *Tereticornis*, which latter seeds at Abbottabad.

Eucalyptus in Baijwat.

73. The "Bund" on the Aik river has been thickly planted with múnj, and will give an income. I should be afraid of this spreading to the fields, and becoming a nuisance. This can indeed be regulated by cutting the flower heads before the flatty seed is ripe.

Planting múnj, caution needed.

AMRITSAR DISTRICT.

74. This district is only in the "dry" class, though it has a rain-fall, which (if a given season maintains the average) should in fair soil (*i. e.*, where it is not heavy clay or 'kalr') raise the rougher sorts of trees without artificial irrigation. Amritsar has 25½ inches, Tarn Táran 24·2, and Ajnála 22·6 inches.

75. The work of road-side avenues calls for no remark: it is summarized in the usual table. It may be noticed, however, that the embankment of the Ajnála-Ramdas road has been thickly set with farásh cuttings, a very useful work.

A grove at the Sadr station was re-stocked, and a new grove at Changaon, where, however, the seedlings were severely damaged by hail.

76. The rain-fall during the year was below the average, which accounted for the partial success attained; while to ensure even that an additional expense had to be incurred for hand-watering by bhistis.

Failure of rain.

77. There was only one central nursery for distribution, but a new one has wisely been started at Changaon (Ajnála tahsíl). Others are promised to obviate the expensive carriage of trees.

Nurseries.

Expenditure.

78. The expenditure was Rs. 6,665, thus—

Establishment (1 Darogha on Rs. 40) 1 Jamadár, 4 peons, 6 gardeners and about 47 bhistis and 28 laborers ...	Rs. 5,772
Expenses:—Contingencies, fencings, extra waterings, &c.	„ 893
	Rs. 6,665

Income.

79. The income by sale of trees and loppings was Rs. 746.

GURDASPUR DISTRICT.

80. This district is classed as "medium," varying from 50 inches at Pathankot to 39 at Shakargarh, and 30 at Gurdáspur; Batala tahsíl is drier, having only 25 inches.

Nothing in the statement of work calls for particular remark. It may, however, be noted that at the Sadr, 2,600 trees were added to the Government garden, but half of them failed.

294 Tún trees were successfully added to the three-acre tún grove near the Kacheri.

30 trees were also added to a three-acre mango grove.

Expenditure.

81. The expenditure was Rs. 3,299 thus, or excluding Rs. 240 subcription to Agri-Horticultural Society, Rs. 3,059.

Each garden has wells and bullocks.

Gurdáspur, gardeners and coolies (16)	Rs. 1,008
Batála, 1 gardener and coolies	„ 108
Shakargarh, gardener and coolies	„ 108
Pathánkot, ditto ditto	„ 120
Bhistis (for whole district)	„ 1,238
Feed of cattle and contingencies	„ 377
	Rs. 3,059

82. This district is now able to report that it has 212 miles of road fairly planted up, only a few blanks to be filled. There are also 23½ acres of groves.

Results of work in this district up to date.

83. I take occasion to note that I observed the new part of the road to Pathánkot, which has been planted, very properly quite close, I suppose some four or five years ago. This now wants thinning very badly. Many trees have two stems or more. All should be removed but one, the best; regular spacing should not be aimed at, but the removal of badly-shaped trees and those leaning over, of which there are many.

Avenue thinning.

KANGRA DISTRICT.

84. This district is almost within the moist Himalayan belt.

The Pálampur Tahsíl is said to have an average fall of 112 inches (which I respectfully, but very strongly doubt); Kángra Tahsíl has 75; Dehra 78; Núrpur 85; Hamirpur 51; and Kulu 58 inches

85. The work is summarized in the "table." It would appear that nothing at all was done in Kulu in the way of roadside planting.

Summary of work.

In Kángra (at Dharmsala) 7,000 deodar seedlings were put out.

In the Tahsíl compound at Pálampur also, *these* cannot be expected to be of any value (except for ornament) at so low an elevation.

In Dehra, Núrpur and Hamirpur, groves of mulberry, tún, mango and jáman were begun, and it is hoped will be extended.

In Kulu 180 "English trees" were planted. It is a pity these were not specified, as the term used is absolutely without meaning.

86. The deficiency of funds is spoken of, and indeed only Rs. 801 were spent; a very small establishment, costing Rs. 234 in the year, is kept up.

Expenditure.

87. In this district I would impress on the authorities the immense importance of restoring *tún*, as a source of great income to the district, 80 years or so hence. Tún has been almost exterminated, yet in districts like Kángra, Gurdáspur and Hoshiárpur is its home. Wherever a grove, even a very small one, of tún trees can be raised, it should be done.

Recommendations—Importance of "tún" cultivation as highly remunerative.

In Kulu, I think it is a pity that year after year nothing is done in the way of arboriculture on roads.

No work now done in Kulu.

I would point out, for example, the case of the hot and dreary road between Bajoura and Larji, and suggest that the dry willow, the Pipal, and in better places the Ríta, should be tried; or little groups of trees, two or three together, might be put in at intervals. Pipal does perfectly well; there are a very few already at this elevation.

Work suggested.

As this is a difficult work, a short distance only should be undertaken.

I think that generally the work in Kángra has been extended over too great a length. It was unwise to attempt such a length of road when the rain-fall was not certain; in one place no less than 29 miles failed altogether.

Work in Kangra too extended.

I think a somewhat larger sum might most advantageously be spent in a district with such capabilities; while Amritsar and other districts spent five and six thousand rupees, this district spent less than Rs. 1,000.

I cannot help urging the growth of tún once more, as certain to pay most handsomely. *Wherever* a grove can be raised, at every thána, school, dispensary, &c., &c., it should be.

HOSHIARPUR DISTRICT.

88. It is to be regretted that no statement accompanies this report, although last year a most complete return was furnished, as should be the case in a district which has great natural advantages, plenty of funds, and should be the pattern for all other districts in arboriculture.

Rs. 5,885 was the amount of the expenditure.

It is stated generally that 27,761 trees were planted, partly in filling up gaps (replenishing), partly on new work—what or where is not stated.

89. "Several species" of *Eucalyptus* gave encouraging result; but I would again invite attention to para. 13 on the subject of *naming* the *Euclypti* which succeed. Some mesquit-beans received, and after a few failures in the winter, the rest succeeded, and are now at a height of 2 to 4 feet.

90. The experiment of growing bamboo by the roadside is said not to have been yet fairly tried. I would suggest that while the hard bamboo of Karnpur, &c. *(Dendro calamus strictus)*, may not be so useful, the larger bamboo, seen in such graceful clumps in Kángra, might succeed; but of course not except

in good and moist soil. Division of roots is really the best way to grow bamboos of all sorts; cultivation by seed is a very slow process.

Mistake in last year's report, para 32.

91. I take occasion to correct a mistake at para. 32 of last report. The tree is not *diospyros montana* but the *gmelina arborea*, (gumhar), a tree which will succeed wherever protection from frost is to be had. In my garden at Lahore two trees fruit abundantly in May 1879.

JULLUNDUR DISTRICT.

92. This is a "medium" district, Nawashahr tahsil has the least rainfall (27 inches) and Nakodar the most. 44 inches. Nearly everywhere, therefore, in *average* years, trees can be raised without irrigation.

This also is a district where *tún* should be cultivated, as one of the most paying crops, likely to add largely in a certain time to the district income.

93. Among the works noted in the table, it should be mentioned that in the Nakodar tahsil on the Dekni road, about 2 acres have been selected, and a beginning made by putting out 100 Chinese mulberry (*M. at ropurpurea*).

At Phillour there were 2 village plantations of shisham, at Gulábwala and Saigábád, also an acre and 5 poles shisham nursery. At Hasanpur a number of date palms were planted.

There are 32 groves on the Sutlej, which are periodically thinned and re-sown with shisham.

At the Jullundur garden a large nursery is maintained, and valuable trees, both fruit and timber, are planted. During the year mesquet-bean, Malta oranges, good kinds of vine, fine peaches, and plantains have been introduced.

It is also said that 400 China mulberry cuttings, obtained from Amritsar, were established and distributed to places on road-sides *in each tahsil*; this is in excess of what is stated in the tabular form.

Establishment.

94. For the river side groves a permanent establishment of a Darogah @ Rs. 15, and 6 peons are kept up; and as the income during the year was Rs. 353, the establishment was more than paid for.

For the district rakh or Bir Sarangwál (recently declared a reserved forest under the Act), an establishment of Rs. 12 a month is kept. A gardener @ Rs. 10, and 4 coolies take charge of the Jullundur garden.

For roads, as in previous years, a permanent gang of road-coolies do both repairs and planting. This system seems to be a good one, as the men must get in time to be experts.

The expenditure was Rs. 2,068, of which 924 covered the cost of establishment described.

Recommendations.

95. I would suggest to the Deputy Commissioner the desirability of gradually converting the Bir Sarangwál into a fuel plantation: I would make trenches at 4 feet apart, loosen the earth and replace it, and sow kikar at the beginning of the rains. A small area planted each year would soon convert the whole into a valuable plantation, without all at once diminishing the grazing income.

LUDHIANA DISTRICT.

96. This is a "medium-to-dry" district, though the statement does not contain, as it should, the rainfall of the tahsils.

The work calls for no special remark; it was very small in extent and quantity. The expenditure was Rs. 5,827, which appears large for such a small amount of work; it is said, however, to have been chiefly spent on maintenance of previous work, and if this was recent, of course it requires as much care in watering, &c., as new work.

Great attention is paid to fencing and protecting the trees.

Recommendation.

97. It would be desirable in future to state what items of expenditure are for maintenance charges, so much for bhistis, so much for fences, &c. Both in 1877 and 1878, over 5,000 rupees were spent in "maintenance," and it should be known how the money is spent.

The District Overseer supervises the labor employed; there is no special arboricultural establishment.

UMBALLA DISTRICT.

98. The return is blank, and nothing is said of expenditure, establishment, or anything else. This is hardly satisfactory in a district with considerable capabilities for planting. Tún, the China mulberry, the tallow tree, and even the sál, might be grown with advantage.

SIMLA DISTRICT

99. Has no arboriculture.

KARNAL DISTRICT.

100. This is a "dry" district, with a rainfall, however, of 24·3 inches in Karnal and 224 in Panipat.

The Statement sent is very complete, indeed more so than is needed; it becomes rather difficult to summarize it in the return. Only totals of tahsíls are required as regards length of road, number of acres, or number of unmeasured plots.

In this district it may be noted the Jomoa (*Elæodendrun Roaburghii*); a very handsome tree, is planted on the roads.

Three nurseries, one at each tahsíl, were filled up and extended.

101. The expenditure was Rs. 4,024. Of this Rs. 2,267 was for maintenance (39 bhistis, 6 pakhálís, costing Rs. 1,732, the rest for gardeners and repairs of mud-wall fences).

Rs. 1,757 was the cost of new work—watering, planting, and mud fences. Rs. 704 was spent on the nurseries, for the wages of gardeners, and the feed of the well cattle and for contingencies.

A detailed estimate was prepared at the beginning of the year, both for maintenance and for the year's new planting and replenishing.

Recommendation.

102. The Kaithal tahsíl planting is noticed as the best. The Deputy Commissioner says the trees were planted too close, but I would suggest to him not too readily to discourage close planting: trees here and there may fail. It is much better to plant close and thin out, than to begin too far apart at first.

The work has evidently in this district received very methodical attention. The Deputy Commissioner himself remarks, however, that the work was too scattered, and proposes next year to confine the area.

I would also suggest for this and every other district wherever the soil is tolerable, to have a central garden, and there to raise good fruit trees, oranges, and so forth, also useful products like the China mulberry, &c., &c., so as to distribute them to villagers and increase the supply of good fruits in the district.

DELHI DISTRICT.

103. The rainfall of the tahsíls is not stated.

It is unfortunate that in the Delhi tahsíl nearly 22 miles, and in the Ballabgarh tahsíl nearly 34 miles, of "replenishment" undertaken, all failed from drought.

In Delhi tahsíl one mile of new road (serai Rohilla Khán to Najafgarh) was successfully planted.

Of groves and plantations it is noted that 50 trees were planted at the school-house of Nanglo Jitan, and 4,700 trees, of which 3,000 were "nim," planted successfully at Mubárik bágh, near the old cantonment.

One thousand four hundred trees were also planted within the compound of the Ballabgarh fort.

104. The expenditure was Rs. 1,843 (of 1,723, excluding 120 subscription to the Agri-Horticultural Society), of which Rs. 904 was for establishment, and Rs. 819 for maintenance, fencing, &c.

Bela plantation.

105. Besides this work, the district authorities managed the Bela plantation under the walls; the expenditure was Rs. 1,289, and the income Rs 510 from thinnings. This plantation, with its costs and income, is now handed over to the municipality. Rain sowings of 50 acres were a failure from flood, and the later sowings (22 acres) from frost.

Plants the ridge.

106. The municipality also spent Rs. 3,960 on their trees within municipal limits, including an important work, which should be noticed, of planting 3,000 trees, chiefly nim and kikar, on "the ridge;" these are said to be thriving.

Recommendations.

107. It is a pity that when the failure of the rains was noticed, orders were not given to stop or not to attempt work. The very extensive failures must have been costly.

It is noted in the report—and this is a wise conclusion—that it does not do to depend so much on *sowings in situ* along the roads, and consequently nurseries have been extended, so as to furnish more *transplants*, which generally, and especially if the area is wisely restricted, can be saved by hand-watering in case of a bad year.

GURGAON DISTRICT.

108. This is a dry district, and the rainfall is variable also; it averages from 16 to 18 inches.

The work on roads, consisting in "replenishment," or filling gaps in previous work, was as follows on roadsides and was not very successful:

The nurseries, the station garden, and the Jhersa bund were planted or sown with a fair amount of success.

At Taorn the compound of the Police rest-house was planted with 2,000 trees, and the "Committe house" with 680 trees.

In Palwal tahsíl 1,645 trees were successfully planted on a plot of ground opposite the tahsíl, and 410 trees were put out on the different encamping grounds.

109. It is stated that on roadsides 39,889 trees were alive at the close of the year, including previous work, and 21,058 trees elsewhere than in avenues.

Expenditure and working.

110. Expenditure amounted to Rs. 2,559; this excludes the station garden nursery, which is "charged to another head."

This garden and the station roads are watered by a well with the "lao-charsa," or rope-and-bucket method of raising the water. Other trees are watered by hand, one bhisti being allowed to each mile of road.

On the Palwal Sohna road, the water is supplied by the canal, but it has to be carried by laborers to the trees.

Out of the expenditure mentioned, included Rs. 2,101 for establishment, of which Rs. 803 represent the costs of bhistis for various periods. A "darogah" on only Rs. 6 must be rather an inferior class of man, and can hardly be of much use.

Mud fences, it is noticed, cost 5 annas each.

Lopping

111. It is gratifying to notice that lopping by the mális, &c., is not allowed. Mr. Roberts thinned the Sohna road avenue under his own supervision.

Kikar sowing.

112. The Deputy Commissioner notices kikar sowing. In order to succeed, it must be light soil which powders easily. A trench is made and the soil pulverized, and partly put back, so as to let the trench be partly hollow to collect rain. If no rain falls the kikar seed will not germinate; but the method is so cheap (where there is any chance at all of its succeeding) that it does not much matter if a failure or two occur: the trench remains and the earth only wants loosening again and re-sowing.

Trees killed down by frost.

113. The way to treat trees which have been killed by frost and then send up new shoots, is at once to cut back all but two or three shoots the first year, and all but one, the best and strongest, the year following. Unless the frost again kills the tree down, the surviving shoot will often make a tree quite as good as ever. If, however, the frost is such that year after year the trees die, it shows that nim and jáman, which are sensitive, cannot be cultivated. Siris will succeed in the end: it is very hardy.

Farásh cuttings.

114. Farásh cuttings 4 feet long, and somewhat thicker than the thumb, are the best; they require water to start them, and not to be driven into the ground, but the ends being clean cut on a slant, a hole is to be *made first* with a stake or iron jumper, and then the cutting put in, about half above and half below ground, and the earth pressed down. Farásh *sowing* in trenches may be tried also.

HISSAR DISTRICT.

115. This is one of the very dry districts All the "replenishment" on 23 miles in the sadr tahsíl failed, one mile on the road to Barwála being partially successful with 250 trees, making a now existing total of 646 trees on the mile.

In the Hansi tahsíl, 8 miles of replenishment were partly successful.

In Bhiwaní, half a mile was a success.

In Fatehábád, a little over a mile succeeded on two different lines.

In Barwalla, 2½ miles "replenishment" failed.

116. While the road work showed so little success, the list of groves and plantations shows better results:

In Hissar itself 14 different places—the Park, Station Garden, Post Office, Dispensary, Police line, &c., &c., were successfully planted.

In the Hansi tahsíl a nursery was established at the encamping ground, at the school, distillery, dák bungalow, and a town road was planted, the latter being a new work.

In the Bhiwaní tahsíl, 10 localities of the same description were supplied with additional trees successfully; and in the Fatehábád tahsíl, 11 similar localities were added to with "partial success" chiefly.

In Barwalla, 7 localities were also treated with partial success, chiefly with kikar sowings.

Expenditure.

117. The expenditure was Rs. 3,499, or Rs. 3,247 excluding the municipal fund expenditure.

The establishment costs Rs 181 a month, or Rs. 2,178 for the year. This includes 10 pakhális @ Rs. 7, 3 ditto @ Rs. 6, and 2 bhistis; this is maintained, as watering must be the chief thing in such a district.

This district *alone* shows as part of its expenditure "Irrigation dues," 3 pairs of bullocks were purchased.

118. I observe that in some places it is noticed that trees failed owing to stray cattle. In such a district I would lay it down as a rule that no tree is to be put out without a fence, palisade, or enclosure of some sort. The trees have difficulties enough to contend with, without such a purely avoidable one as cattle-browsing. I would be inclined to keep up fewer gardeners, &c., on low pay, having a few good men, taking on daily labour when required, and requiring each tahsíl to confine its road operations to one or two places to be slowly and carefully gone over, fencing each tree and covering the soil round the trees with a thick matting of loose straw, dead leaves, &c. (3 inches), to retain moisture.

Recommendations.

Method of economising moisture.

ROHTAK DISTRICT.

119. This is a dry district, the rainfall being 21 inches at Rohtak, 22 at Sámplá, 23 at Gohánâ and 20 at Jhajjar.

The work in the table calls for no remark. Failures from "blight" are recorded, but I do not know what is meant.

No groves or plantations were made or repaired.

120. The expenditure was Rs. 4,040. Of this Rs. 3,801 was spent on establishment, consisting of 1 Superintendent @ Rs. 15, 37 malís costing Rs. 1,940, and 35 bhistis, who use their own pakháls and bullocks, and bring water from the nearest tanks and wells. The district committee have not sunk any wells of their own, as the depth of water line is great and the expense would be enormous.

The operations for the year were estimated before hand.

121. It is said that kankar is a great cause of failure at from 4 to 6 feet below the surface, and thick bed of kankar, from 4 to 5 feet thick, was discovered; below that, the soil was soft. It is surprising that 6 feet of earth above the kankar should not support most ordinary kinds of trees. If it is not so, there is no chance but to dig through the kankar, which must be rather costly. Wherever the kankar is near the soil, it should certainly be adopted. Wherever it has been tried the result has been success.

Kankar in the soil.

Nurseries. 122. There is a nursery at each tahsíl, and a few on the roadside.

It is proposed that in canal villages small plots of nursery shall be formed at the head-quarters of the ala-lambardars; this is to be discussed by the district committee, as it may involve paying for land.

SIRSA DISTRICT.

122*a*. This is a difficult district. Although the rainfall does not show the aridity, *e. g.* of the South Punjab districts, Sirsa has 23·4 inches rainfall, Dabwali 17·4, and Fazilka 17·8 inches. The work was ordinary and calls for no remark. Its contents may be seen in the table.

123. The expenditure was only Rs. 679.

The trees when put out are usually fenced with the thorny branches of the (beri) *zizyphus nummularia*, held down by clods of earth. Rain *sowings* are usual. Nothing is said about transplanting.

CANALS.

124. It should be explained, for the sake of those not familiar with the subject, that the area available for planting on a canal consists of part only of the strip of land taken up.

Ordinarily speaking, the material excavated from the canal is thrown up part on either side, leaving, however, next the channel itself a roadway used as an inspection road. The "spoil" is levelled off. Beyond the spoil, again, comes the boundary ditch, and beyond that, the boundary road, which country carts go along, which they are not allowed to do on the patrol or inspection road.

The *avenue* or *line* of trees on a canal will be on the outer side of the patrol road, or side next the spoil; on the inner side, next the channel, trees are not allowed, as their roots would injure the banks, &c.

Line plenty.

The levelled top of the spoil bank constitutes the *area* available for broadcast sowing or grove planting, and is usually stated in acres, while the line along the patrol road is, of course, given in miles. As on the slopes of the bank no trees are planted or sown, the avenue or tree line is distinct from the plantation.

Plantation by area.

125. In some canals it is observed that no avenue is planted, only the spoil bank is covered with trees. In many places this covering is by natural spread of seedlings. In some also (as Dera Ghazi Khan) it is partly one, partly the other.

Natural stocking.

I would request Canal Officers not to exclude the length of line or area of spoil bank naturally stocked. However it has happened, it is just as much stocked as if it had been planted, and it is easy to add a note or "remark" to explain.

Length includes both sides.

126. It is always understood that the *length* given refers to both sides; thus—300 miles means a canal of 150 miles course on both sides.

Wherever a canal and its branches has been completed, the total length will remain constant; but in other cases it will vary as new lengths are constructed or new branches added.

The 1st Division Bari Doáb Report has not been received.

Bari Doab, 2nd Division.

I. Avenue.

127. Total length ... { Lahore branch ... 124 miles.
Lower main branch ... 186 „
Kirn escape ... 23 „
333 „

Avenue complete	...	...	280 miles
Avenue incomplete	...	...	53 „

Work of the year.—Planting 4,000 trees on the incomplete portion, how many miles is not stated. 75 per cent. of the trees succeeded.

II. Spoil Banks.

128. Area sown already, 2,077 acres; added during year 100 acres; still remaining to be done 1,423 acres.

The 100 acres were in two different places; 31 acres were *sown* with shisham,—this succeeded, the rest failed.

A portion of the unplanted spoil is either too high to get moisture, or of such bad soil that only tamarisk can be cultivated.

III. Chauki Compounds.

129. The following fruit trees were added :—

50 Orange
104 Peach
8 Plum
20 Black plum (allú bokhára)
35 Vines.

IV. Management.

130. Thinning has been carefully carried out; 45,000 maunds of fuel (about 180,000 cubic feet stacked) was readily sold at Rs. 20 per 100 maunds (about Rs. 5 per 100 cubic feet).

Sisu is the principal tree in the division.

131. An interesting fact should be noted, that in very bad places trees are gradually being established by digging large holes, which are filled in with *berm silt* from the canal.

131 The financial aspect is thus stated :—

Receipts—				
Sale of wood	Rs.	9,060		
Grass and fruit	„	2,751		
				11,811
Expenditure—				
Establishment	Rs.	3,205		
Working	„	3,735		
Sowing spoil banks	„	1,434		
Maintenance of compound		540		
				8,914
			Surplus...	Rs. 2,897

Upper Sutlej Inundatin Canals.

132. There appears to be 301 miles in this division, as follows :—

Katora Main Canal	66	miles.
Attari Rajbaha	23	"
Pakoki do	10	"
Chúnian do	17	"
Khanwah Main Canal	81	"
North Rajbaha (18) and south Rajbaha (12) ...	30	"
Bahawaldas Rajbaha	5	"
Upper Sohag Main Canal	57	"
Bunga Saliwal Rajbaha	5	"
Baparwat do	7	"
Total...	301	miles.

No distinction is drawn in this division between a line of *avenue* and the spoil bank planting.

The whole gets covered with self-sown seedlings, chiefly kikar. This is helped here and there by sowing.

It can easily be stated what length of this canal line is stocked, and so requires no further planting.

The area of spoil banks is said to be 1,500 acres, which seems to be very small for such a length of canal.

133. Financially the results stand (no establishment being kept)—

Income—		
Sale of wood	Rs. 703	
" grass	" 1,308	
		2,011
Expenditure—		
Maintenance, &c.		237
Surplus...	Rs.	1,774

134. The districts are said to be rainless, and that arboriculture would not pay; nevertheless, if self-sown seedlings answer the purpose, it seems that some statistics might be given.

Lower Sutlej and Chenab Inundation Canals.

135. The length here is 10 miles on the canal and 32 miles on the Chenáb bund; total 42 miles. Afterwards, at paragraph 7, it is stated that the whole length of the canals is 1,363 miles (*i.e.*, as usual 681 miles on both banks. If we are to understand by this that only 42 miles out of this great length are available for the growth of trees, it would be desirable to explain the case in a few lines. Of the 42 miles, however, it would appear that 36 have been successfully completed.

Plants are usually put in at 30 feet apart, except on the Chenab bund, where the kikar is close. Six miles, *i. e.*, four in the bund and two on the river side of the Sikandarabád canal, are not complete owing to the flooding of the ground. Might not willows here be tried with success?

Some gaps were filled up in existing lines during the year.

II. Spoil Banks.

136. The area of spoil banks connot be given; nor can they here be sown, as the annual clearings would bury the trees. Trees have been tried at the toe of the *outer* slope, but the earth falling down buries them.

III. Chaukis.

137. So many have no wells that the trees are maintained with difficulty, only a few were planted at Bhinda Gargana Chauki :—

Financial.

138. *Income*—

Sale of wood	Rs.	1,739	
" fruit, &c.		129	
" Múnj and grass		3,141	——5,009
Expenditure—			
Planting		916	
Establishment		423	
Watering, &c.		340	——1,679
Surplus...	Rs.		3,330

Indus Canal (Dera Ghazi Khan).

139. Total length 1,334½ miles (including bund). Total planted 155½ miles.

To this was added during the year 8¾ miles planted at 15 feet apart, chiefly shisham. Some mistake appears, as the new work of the year (besides the above) is spoken of as something in the future, though the year had closed when the report was sent in.

It is unfortunate, however, that the self-sown trees, which here are numerous and remarkable, are not taken into account.

Natural sowings.

140. Lengths and areas stocked naturally should be included in the "finished" portions, with a note saying how the stock was produced.

Sissu tallow tree (*excœria sebifera*), (*salvadora*) date palm, kikar, bir jand, siris, are the most abundant in the order in which they are stated.

II. Spoil Banks.

141. The spoil banks are apparently not sown, nor is the area known. I should have thought the self-sown trees would be on the spoil, but it seems not to be the case; on the other hand, it is difficult to suppose that they come in lines as avenues naturally.

III. Chaukis.

142. Nurseries are kept up to supply trees at six different chaukis, and other temporary ones where wanted.

28,600 young trees were raised.

IV. Financial and Working.

143, *Income*—

Sale of wood	...	...	... Rs. 1,151	
„ grass	...	...	... „ 42	—1,193
Expenditure—				
Establishment	...	...	... „ 4,510	
Working	...	...	... „ 550	
Maintenance, &c.	...	...	... „ 778	—5,838
			Deficit... Rs.	4,645

The total number of self-sown tree diminished; this was owing to cutting to supply material for protective works, spurs, &c., against floods.

In some chaukis damage was done by river erosion and flooding.

144. Some trees were bent over by the wind, the ground having become soft by flooding on subsidence of the water. Many of these have been successfully restored to an upright position.

Shahind Canal Main Line Division.

Avenues.

145. Total length 78 miles.

Planted do. *nil.*

Nor was any work done during the year; the water is not yet let on, and avenue-planting would be useless at present.

II. Spoil Banks.

146. Area sown already is 806 acres, of which 140 acres were sown during the year, leaving 365 acres, more or less, to be sown in future years.

The sowing is with mulberry, jáman, mango, tún and kikar, with some teak and *eucalyptus* (species?).

III. Financial.

147. Although no income is recorded, a quantity of brushwood has been supplied for making fascines. The expenditure on sowing was Rs. 1,004.

It is not intended to incur expenditure on line-planting, establishments, &c., till water let on. Sowing the spoil banks, as they are levelled off, is alone permitted at present.

3rd Division.

148. Total length available—

Combined branches	...	8 miles
Abohur do.	...	96 „
Battinda do.	...	24 „
	Total...	128 miles

I regret that the return is not understood. The total length of canal to be planted is 128 miles (taking both sides). It is said that 100 miles of this had already been planted, out of which 100 miles represented the work of planting done in the year under report. From the remarks opposite, I am doubtful whether I should infer that 18 miles have been entirely finished, three partly so, and that consequently 79 miles (to make up the 100) have failed entirely. This is hardly likely to be the case.

II. Spoil Banks.

149. Area sown, ... 332 acres.
Added during the year ... 102 „
Remaining to be done ... 618 „

The sowings are broadcast of shisham and kikar.

On the Abohur branch sissu thrives particularly well. Locusts destroyed a large number of kikar on the 40th, 41st, 42nd, and 43rd miles. The system adopted is to sow by contract, full payment being made only after testing results.

III. Chaukis.

150. On miles 32 and 51, Abohur, and miles 12 and 22 on the Bhattinda branch, the chaukis are planted with sissu trees.

IV. Financial.

151. *Income*— *Nil.*

Expenditure—

Establishment	Rs.	81
Maintenance and working	„	477
Sowing spoil banks	„	692
Contingencies	„	8
	Rs.	1,258

Cultivation of castor oil.

152. The castor oil plant was experimentally cultivated on the Abohur branch. In places they have spread over the spoil banks, and this gives "a wild and neglected appearance." It is no doubt true that castor oil impoverishes the soil, and that it is anything but a good preparation for trees. On the other hand, it would be easy to keep the castor oil plants in order, and weed them out of irregular places. I have no means of judging how far the plant is desirable in localities spoken of in the report; but the S. P. and D. Railway have been spending money on watering and manure to, I believe, a considerable extent, for the express purpose of raising this plant (for the manufacture of oil used in lubricating machinery, and for lighting also, so that it might turn out that spoil banks, covered with the "wrind," would prove highly remunerative when the fruit is gathered. This is worthy of consideration.

4th Division.

I. Line Planting (Avenue).

153. Total length ... ... 94 miles.
Length finished ... ... 0 „

No work was done but to start a "plantation" (nursery is apparently meant), which had 15,500 young shisham; of these 3,000 were put out along roads; apparently not on the canal line above indicated, or this would have stocked at 15 feet apart some 11 miles or so.

II. Spoil Banks.

154. The area is not stated, and no part of it has been planted or sown. A quantity of kikar, and five times as much of sissu seed, has been collected to be sown in trenches on the spoil along the lower 10 miles, "where the water is not too deep below the surface."

III. Chaukis.

155. Three chauki compounds have been planted with 200 shishams.

IV. Financial.

156. There is as yet of course no income, and the expenditure has been small, only Rs. 200.

6TH DIVISION.

I. Line Planting.

157. Total length 182 miles.

Gaggar Branch	...	...	...	108 miles.
2nd Feeder	...	...	...	4 „
3rd Feeder	...	...	...	20 „
Navigation Channel	...	...	...	10 „
Choa Branch	...	...	...	40 „
			Total	182 miles.

Length successfully planted 29 miles. No new length was undertaken during the year, but the 29 miles previously put out were tended, These consist of some 10,700 trees,—siris, jáman, sissu, mulberry, and kikar. The height averaging three to six feet.

II. Spoil Bank (Plantation).

158. The area of spoil bank previously planted is *nil*, but during the year 1,439 acres were sown. Kikar plants, over 98,000 in number, are reported alive on the Gaggar Branch, besides smaller numbers on the 2nd and 3rd feeders.

Frost and drought nearly destroyed the sowings on the Choa Branch.
815 acres still remain to be sown, thus—

Last 5 miles of Choa Branch	...	65 acres.
Gaggar Branch	...	696 „
Navigation Channel	...	54 „
	Total	815 acres.

III. Chaukis.

159. Nine chauki compounds were planted, each with 200 trees, including fruit trees and the useful "nim." All are doing well.

Water is not yet admitted, and therefore line planting and other work is not permitted.

IV. Financial.

160. No income, of course, can be expected as yet.

The expenditure was Rs. 3,780, of which Rs. 72 was for gardeners, and the rest for sowing the spoil banks, which is cheap work, being a little over Rs. 2-8 an acre.

161. I may remark that wherever kikar sowings are undertaken there is no occasion to be dissatisfied if a considerable portion of the young seedling, that come up thickly, die off either by frost or white ants. It is in the nature of kikar to form an open growth, and it will be found that what looks like only a few trees remaining will in a short time form a quite sufficient cover. Re-sowing need only be resorted to wherever there are actually blank patches.

WESTERN JUMNA CANAL.

KARNAL DIVISION.

I. Line Plantation:

162. Total length 180 miles, also 70 miles on escapes and 80 miles on rajbuha.

From Dadupur, and including the road to Kherwán, but excluding secondary channels and escapes, &c.

Above Dadupur the canal can scarcely be said to have banks in the sense of an area available for line or area planting, and at other parts also there is no available space.

Nearly all this line has long ago been planted, and possesses fine trees. Only on some of the rajbuhas is planting still in progress.

II. Spoil Banks (Plantation).

163. There are no spoil banks, but there are plots of waste land, *viz.*, islands, old bends subsequently cut off by a straightened channel, lands taken up for protective works, and so forth. Of this area about

1,500 acres have been already planted, the remainder being let out for cultivation and grazing. Part is also being covered from time to time with trees; kikar is the chief tree, but sissu and other common trees are also abundant. A valuation in 1876, of the head subdivision only, gave 188,000 trees.

Near Dadupur there are sál and teak trees, and *pinus longifolia* growing side by side!

III. Chaukis, &c.

164. At Dadupur and at Karnál there are a few mango gardens.

The old chaukis are all planted up for shelter.

At Abdullapur and Radaur there are newer plantations, which required watering and care during the year.

IV. Financial.

165. *Income—*

Sale of wood	Rs.	1,946
„ fruit		290
By leases of cultivators		2,644
„ grazing		1,676
„ sale of grass		728
	Rs.	7,284

Expenditure—

Establishment of malís (a Forester has since been appointed) ...	Rs.	150.
Working and contingencies (not given).		

The statement has been sent incomplete, but it is evident that these plantations now yield a large profit. The sales of wood, however, are far smaller than those of the Bari Doab Canal.

New Main Line Division.

166. Total length of line { New Main Line ... 31 miles. / New Hansi branch ... 12 „ } Total 43 „

Length operated on ... ... 19 „

Here there is no distinction between an *avenue* or *line* planting, and the sowing of *areas* on the levelled spoil banks. The 19 miles spoken of were done by sowing lines of sissu and kikar at 10 feet apart on the soil.

II. Plantations.

167. I am not sure whether I am to mention the 200 acres sown from mile 0 to mile 9, on spoil banks as separate from, and additional to, this or not.

III. Chaukis.

168. In Rampa compound, a nursery of cuttings of pipal, bor, and willow has been started.

I would not recommend "pipal" and "bor" as a rule for canal plantations, the wood is of no use. They may be desired, however, at chaukis or other places where shade and protection are the object.

IV. Financial.

169. This work was all under construction, and of course planting cannot be carried beyond a certain stage, and does not yield an income. The expenditure was Rs. 848, of which Rs. 73 was the pay of a Forester and a malí.

HANSI DIVISION.

170. Total length for planting 500 miles, including branches.

No line planting has been done, and there are no spoil banks fit for planting.

II. Chauki Compounds.

Only one garden at Botána was added to during the year, 117 mango trees being planted.

171. I do not, I confess, understand this report, though there are neither lines of trees nor spoil banks sown or planted, and nothing was done except to plant 117 mangos at Batána. In the expenditure Rs. 195 for planting trees at Hissar appears; under each canal (Hánsi, Rohták and Batána) small sums appear as *cost of counting trees*; while, strangest of all, the large sum of Rs. 1,571 appear for collecting and stacking wood. The total result was—

Income—					
Timber	...	...	...	...	Rs. 5,620
Fuel	...	...	...	...	„ 2,104
Charcoal	...	...	...	...	„ 147
Fruit	...	...	...	...	„ 78
Grass, &c.		...	...	...	„ 55—8,004
Expenditure—					
Maintenance and contingencies			...	...	„ 476
Collecting and stacking wood	...		...	...	„ 1,571—2,046
					Surplus Rs. ... 5,958

172. These are the concluding "General remarks":—

"As shown above, nothing has been done during the year under review towards new plantations. The old trees are dying off fast; numbers fall annually. Those growing on the canal berms rot at the roots through excess of moisture, and fall; the timber produced is very bad and fit only for firewood. I consider it quite useless to attempt to grow trees upon the canal berms, swamped as they are for the most part with water. The line trees are differently situated; but if new ones are planted to fill up gaps, the monkeys at once destroy them. Kikar seems the only tree that would be able to escape the ravages of these pests."

DELHI DIVISION.

1*st Subdivision.*

173. Total length for planting, 74 miles { No. IX Rajbuha 30 miles; No. XII Do. 44 „ } = 74 miles.

Total finished, 10 miles; still incomplete 64 miles.

The details of the work in the 10 miles on Rajbuha IX show good growth; but three miles on Rajbuha XII attempted this year are not looking very promising.

This leaves 20 miles on IX, and 44 on XII, unless the three miles succeed after all.

II. Spoil Banks.

174. There are only 360 acres of spoil banks not sown.

IV. Chaukis.

175. There are fruit gardens at Naultha, Sardána, Rohtak, and Palsi, and one of grafted mangos at Isrána, a new compound at Sarag that was planted with fruit trees during the year.

Financial.

176.

Income—					
Sale of wood	...	...	...	...	Rs. 389
„ fruit	...	...	...	...	„ 218——607
Expenditure—					
Establishment	...	...	...	...	„ 254
Work and contingencies		...	...	...	„ 123——377

(2ND SUBDIVISION.)

Line Planting.

177. Total length, 82 miles, all complete and well-wooded, mostly shisam, jáman, kikar, and mulberry.

II. Plantations.

178. There are 497 acres sown over with trees of the same kind.

III. Chaukis.

179. There are here also several fruit gardens, which call for no remark.

IV. Financial.

180. *Income—*

Sale of wood	Rs.	2,832
„ fruit	„	554
Total	Rs.	3,386
Expenditure—		
Contingencies and tending fruit gardens (no establishment) ...	„	69
Surplus	Rs.	3,317

Since 1874 no operations have been carried on; the gardens are taken care of without *fixed* establishment. Monkeys here infest the lines and destroy seedlings.

NEW DELHI BRANCH.

181. Total length available is 65·7 miles; of this, three miles on one bank has been planted. No spoil bank area has yet been sown.

At chauki compounds only 170 mulberry trees have been planted; but whether there are any other existing gardens does not appear.

There is no income, and the expenditure is only Rs. 321.

The earth is not settled enough yet on the spoil banks to make sowing advisable.

182. In all reports it is noticed that little or no account of chauki compounds is taken. It might be noted that the total number is so and, so, each having a certain area, if that can be given, or a certain number of trees; that so many have *fruit* groves and so many timber or ordinary trees. The number of special fruit gardens on the Western Jumna Canal line might also be stated, as well as the new areas added.

H. B. BADEN-POWELL,

Conservator of Forests,

Punjab.

APPENDICES.

Arboriculture Statement of the Punjab Districts for the year 1878-79.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous year which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
				PESHAWAR.			
				Roads.			
Peshawar ... (dry 20 inches).	1	Length of road undertaken in the year (49 miles).	13	36	Blanks filled on (?) miles. (10,070 trees).	Planted up miles? (6,800 trees.	
Mardán ... (dry 24 inches).	2	Do. 100 miles ...	71	29	Do. miles? (4,593 trees).	miles?	About 800 failed.
Hashtnagar ... (dry 19 inches).	3	Do. 23 miles ...	16	...	Do. miles? (1,363 trees).	...	
Doába Daudzai ... (dry 21 inches).	4	Do. 53 miles ...	14	39	Do. miles? (5,590 trees)	...	
				Groves and Plantations.			
Peshawar ...		Jail and encamping ground.	...	...	...	334 trees ...	Success.
Mardán ...		At Schools, Rustam and Mardán.	...	...	...	118 „ ...	Do.
Hashtnagar ..		At Charsadda School ...	...	...	...	204 „ ...	Do.
				DERA GHAZI KHAN			
				Roads.			
Dera Ghází Khan.	1	Ditto 174 miles ...	159	15 miles ...	11 miles ...	...	Work confined to filling blanks caused by the flood, and was partially successful.
Jámpur ...	2	Ditto 40 miles ...	34	6 „ ...	4 „ ...	...	
Rájanpur ...	3	Ditto 11 miles ...	...	11 „ ...	6 „ ...	...	
				Groves and Plantations.			
Dera Ghází Khan	4	Kotla Sikháni rakh ...	...	...	20 acres in two plots.	...	Re-sown after destruction by flood, partially successful.
		6 nurseries ...	...	...	...	Several thousand plants.	

			RAWALPINDI. *Roads.*				
Rawalpindi ...	1	Ditto 2 miles ...	2	...	...	922 trees ...	Shisham.
Attock ...	2	Ditto 17 „ ...	4	13	1,720*	1,440 „ ...	* All failed for want of rain.
Pindigheb ...	3	Ditto 88 „ ...	7	61	...	277 „ ...	Out of this 160 failed.
Kahuta ...	4	Ditto 132 „ ...	100½	31½	...	3,302 „ ...	All succeeded.
Fatahjang ...	5	Ditto 98 „ ...	59	39	...	2,933 „ ...	Of which 1,125 failed.
			Groves and Plantations.				
Kahuta ...		Tahsíl compound ...	...	...	...	65	60 trees failed.
Fatahjang ...		Ditto ditto ...	...	...	...	80	20 „ „
Ditto ...		Ditto ditto ...	...	...	...	15	12 „ „
Ditto ...		Garden and dispensary ...	...	...	...	53	Of which 5 failed.
			JHELUM *Roads.*				
Jhelum ... (rain-fall) ?	1	Length of road undertaken in the year ?	20 miles ...	miles ? ...	miles? (1,925 trees).	miles? (1,114 trees).	980 trees failed.
Pind Dadan Khan	2	Ditto 61 miles	36 „ ...	25 miles ...	miles? (7,206 „)	miles ? (3,975 „)	Failure 2,480 trees.
Talagang ...	3	Ditto ?	13½ „ ...	miles ? ...	miles? (2,626 „)	miles? (2,040 „)	820 trees failed.
			Groves (not distinguishable in return).				
			GUJRAT *Roads.*				
Gujrát ...	1	Ditto 25 miles and some station roads.	?	?	8 miles	1½ miles	New fencing and watering of young trees and replacing here and there withered trees. Succeeded.
			SHAHPUR *Roads.*				
Shahpur (dry 21 inches).	1	Ditto 7 miles and some station roads.	7 miles	...	miles? (945 trees).	miles? (1,000 trees).	
Bhera ... (dry 11 inches).	2	Ditto 38 miles	6 „	32 miles ...	3 miles (1,600 trees).	...	Out of this 890 failed owing to drought.
Khushab ... (dry 13 inches).	3	Ditto 51 miles	40 „	11 „ ...	miles? (4,000 trees).	2 miles (3,200 trees).	9th and 10th mile *double* row on either side.
			Groves and Plantations.				
Shahpur ...	...	Tahsíl compound ...	...	...	...	1 grove area ? ...	Kikar and shisham partly successful.
Bhera ...	...	4 groves on Gujrát road...	...	...	15,725 trees ...	...	Ditto.
Khushab ...	...	Grove 2 kanals near Sodhi Garden.	...	...	...	2 kanals ...	Successful.
...	...	Tahsíl compound ...	...	...	...	200 trees ...	These all failed.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Continued.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work	7 Remarks.
			GUJRANWALA.				
			Roads.				
Gujránwála ... (dry 25 inches).	1	Tahsíl compound 83 miles	32 miles ...	43 miles ...	43 miles ...	...	On the whole fairly successful.
Wazirabad ... (medium 34 inches)	2	Ditto 27 „ ...	13 „ ...	14 „ ...	...	9 miles (2,120 trees)	530 trees failed.
Háfizabad .. (dry 27 inches).	3	Ditto 92 „ ...	77½ „ ...	14½ „ ...	14½ miles ? ...	...	Partial success.
			Groves and Plantations.				
Gujránwála ...		Nurseries ...	...	...	...	3 plots ?	On roads radiating from civil station (success).
Wazirabad ...		At sarai ...	2 acres ...	Some blanks ...	?	?	
			LAHORE.				
			Roads.				
Lahore ..	1	Length of road undertaken in the year, 15 miles.	4 miles ...	11 miles ...	4 miles blanks filled.	...	With partial success on 2 miles; rest success.
Sharakpur ...	2	Ditto 69 miles	55 „ ...	14 „ ...	14 miles ditto	...	Apparently the gaps on the 14 miles planted were all filled.
Chunián ...	3	Ditto 69 „	41 „ ...	28 „ ...	23 miles ditto	1 mile.	
			FEROZEPORE.				
			Roads.				
Ferozepore ...	1	Ditto 75½ „	27½ „ ...	48 miles ...	miles ? blanks filled (18,421 trees).	miles (2,514 trees)	Original return not intelligible, as some miles are entered both as successful and partially successful; it is understood that in every such piece some blanks were successfully filled; others failed. 63,124 trees failed.
Moga ...	2	Ditto 31 „	8¼ „ ...	22¾ „ ...	22¾ miles ? ...	...	
Zírah ...	3	Ditto 107 „	59 „ ...	48 „ ...	...	miles ? (with 8949) trees.	
Muktsar ...	4	Ditto (?)	100 „ ...	?	miles ? filled with trees.	miles ? (3,210 trees)	

		Groves and Plantations.					
Ferozepore ...		15 groves or plots ...	...	...	...	acres ? (1,719 trees)	Only a few failures of these groves, 9 are at intervals on the Grand Trunk Road, the rest at various places in the tahsil.
Moga ...		Two groves ...	...	...	...	475 trees ...	Partial success.
Zírah ...		3 groves ...	...	...	...	17,916 trees ...	Ditto.
Muktsar ...		10 groves ...	...	20 acres	...	acres ? with 566 trees.	Each grove contained some trees, and were added to in the year.
		MONTGOMERY. *Roads.*					
Dipálpur ...	1	Ditto 38 miles	32 miles ...	6 miles ...	miles ? (blanks filled with 540 trees)	...	These 540 trees all failed.
Pákpattan ...	2	Ditto 29 miles	28 „	1 mile ...	miles ? (blanks filled with 71 trees)	...	Do do all failed.
		Groves and Plantations.					
Montgomery station.		Various places ...	...	...	6,993 trees ...	1,061 trees ...	Includes trees planted at Dák Bungalow Kutcherry.
Chíchawatni ...		Dák Bungalow ...	...	...	1 acre existing 151 blanks filled.	30 new trees ...	Church and city gardens, &c.
Dipálpur ...		Attári ...	...	9 acres already ...	1,019 ditto	acres? 2,980 trees	Of these 324 trees died. New trees added to the previous plot of 9 acres.
...		Tahsíl garden ...	...	...	1,916 trees ...	...	
Gugera (station)...		1 plot (8 marlas) ...	...	...	...	2,000 trees ...	1,700 failed out of this lot.
...		At 16 different places ...	...	...	5,318 „ ...	...	Small groups of trees throughout the tahsil.
		MOOLTAN. *Roads.*					
Mooltan ...	1	Ditto 47 miles	18 miles ...	29 miles incomplete with blanks	miles ? blanks filled with 598 trees.	...	Of these 83 died.
Shujabad ...	2	Ditto 12 „	10 „ ...	2 ditto ditto	2 miles blanks filled (100 trees).	...	
Lodhrán ...	3	Ditto 130 „	68 „ ...	62 ditto ditto	34 miles (1,284 trees).	...	Failure 642 trees.
Mailsi ...	4	Ditto 65 „	40 „ ...	15 ditto ditto	17 miles (1,227 trees).	...	Failure 477 trees.
		Groves and Plantations.					
Lodhrán ..		At tahsíl ...	...	1½ acres ..	2,205 trees ...	...	Is this a new addition or a re-stocking of the old 1½ acres ?
Jalálpur thána ...		Thana ...	...	½ an acre ...	...	1,000 trees.	
Sarai Sidhu ...		At Tahsíl ...	...	½ an acre ...	trees ...	...	Seedlings of kikar, shisham and siris; 1,000 failed out of these.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Continued.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
			JHANG.				
			Roads,				
Jhang ... (dry 21 inches).	1	Length of road undertaken in the year 101 miles.	91¾ miles ...	9¼ acres ...	9½ miles all blanks filled with 547 trees.	...	With success.
Chiniot ... (dry 9 inches).	2	Ditto 52 miles	50 „ ...	2 „ ...	2 miles all blanks filled with 279 trees.	...	
Shorkot ... (dry 19 inches).	3	Ditto 34 „	32 „ ...	2 „ ...	Do. (513 trees)	...	
			Groves and Plantations.				
Jhang ...		Sadr garden ...	5 acres ...	...	...	12 poles with 7,369 trees.	(Cuttings).
Shorkot ...		Tahsíl garden ...	2 „ ...	...	...	15 poles 300 trees)	*Note.*—The "chaks" are alluded to in the Narrative, and are not entered in this table.
			MUZAFFARGARH.				
			Roads,				
Muzaffargarh ... (dry 11 inches).	1	Ditto 82 miles ...	57 miles ...	25 miles ...	13 miles blanks filled.	1 miles 100 trees	With partial success.
Alipur ... (dry 11 inches.	2	Ditto 53½ „ ...	33½ „ ...	20 „ ...	5½ miles ditto	...	40 trees destroyed on account of flood.
			Groves and Plantations.				
Muzaffargarh ...		At tahsíl ...	½ acres ...	...	...	83 trees ...	Of shisham and plot completed (?).
		Dispensary ...	¼ acres ...	...	...	80 „ ...	Ditto ditto.
		Telehri garden ...	...	26 accres ...	...	115 fruit trees ...	5 died on account of frost.
Sinánwán ... (dry 10 inches).		Kotádu camping ground ...	2 acres ...	...	..	32 trees (shisham)	108 trees had been planted; but failed on account of bad soil and drought.

Sialkot.

Roads.

Zafarwál ...	1	Ditto 16 miles ...	...	16 miles but blank.	5 miles blank filled with (6,140 trees.)	...	No new work was taken up this year on account of drought.
Pasrúr ...	2	Ditto 108 „ ...	7	101 „ ditto ...	101 miles with 9,816 trees,	...	
Raya ...	3	Ditto 89 „ ...	23	66 „ ditto ...	20 miles blanks filled with 3,580 trees	...	These mostly succeed. On the 46 other miles attempts to fill blanks failed.
Siálkot ...	4	Ditto 48 „ ...	5	43 „ ditto ...	33 miles with 6,500 trees.	...	12 miles of this was perfect success, and 21 still left blanks.

Groves and Plantations.

Pasrúr ...		Tahsíl garden ...	...	1 rood ...	100 trees.	...
„		Gulu Shah Fair ...	...	?	40 trees.	...

Amritsar.

Roads.

Amritsar ...	1	Length of road undertaken in the year 53½ miles.	29½ miles ...	19 miles ...	miles all blanks filled with (1,014 trees).	5 miles planted with 1,482 trees.	210 trees failed of new work.
Tarn Taran ... (dry 24 inches)	2	Ditto 32 „ ...	20 „ ...	12 „ ...	miles ? with 531 trees.	...	
Ajnála ... (dry 22 inches)	3	Ditto 51 „ ...	26 „ ...	25 „ ...	miles ? with 1,069 trees.	...	182 trees failed.

Groves and Plantations.

(None.)

Gurdaspur.

Roads.

Gurdáspur ... (medium 30 inches)	1	Ditto 76 „ ...	20 miles ...	56 miles ...	5 miles blanks filled with 625 trees.	...	(District statement unintelligible.)
Batála ... (dry 25 inches).	2	Ditto 47 „ ...	9 „ ...	38 „ ...	25 miles with 416 trees.	9 miles (nearly all failed).	Out of the 416 trees planted, 359 are alive. 60 trees only on the 9 miles survived owing to the drought.
Shakargarh ... (medium 39 inches)	3	Ditto 62 „ ...	31 „ ...	31 „ ...	31 miles with 2,110 trees.	31 miles with 1,400 trees.	All blanks were filled in by 2,100 trees, of which only 80 died. New work all successful.
Pathánkot ... (medium 50 inches)	4	Ditto 47 ...	17 „ ...	30 „ ...	...	17 miles with 378 trees.	Success.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Continued.

Tahsil.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 Number of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work.	7 REMARKS.
		Groves and Plantation.					
Gurdáspur ...	1	Government garden ...	...	17½ acres.	2,600 trees added	...	Of these 1,100 died.
...	2	Tún groves ...	...	3 acres.	334 trees added	...	Of these 40 died. Understood this to be a grove, *not* a nursery, to supply seedlings to other places.
...	3	Mango gardens ...	...	3 acres.	30 trees	...	
		KANGRA, *(Roads.)*					
Núrpur ... (85 inches).	1	ditto 95 inches ...	52	43	39 miles blanks filled, 20 of these miles, were completed.	6 miles (failed).	2,295 trees died on new work on account of dry season.
Kángra ... (75 inches.)	2	ditto 77 „ ...	32	45	41 miles completed	...	No rain-fall at the planting season. Lenere trees were not planted during the year.
Dera ... (76 inches).	3	ditto 93 „ ...	48	45	16 miles do.	...	29 miles attempted failed altogether.
Hamirpur ... (51 inches).	4	ditto 127 „ ...	78	49	43 miles do.	9 miles with 1,100 trees.	6 miles replenished (besides this) failed. Of new work one mile failed altogether.
Pálampur ... (112 inches).	5	ditto 66 „ ...	46	26	?	?	
Kulu ... (58 inches).	6	ditto 178 „ ...	32	...	...	...	No work at all.
		Groves and Plantations. (Nurseries and groves mentioned in the Narrative).					
		JULLUNDUR. *Roads.*					
Jullundur. ... (medium 43 inches).		Length of miles 34¼ ...	...	34¼ blanks to be filled.	18¾ miles, gaps filled up.	...	With shisham and mango.

Nakodar ... (medium 44 inches)		Ditto 18 ...	8	6 do. do.	2½ miles ditto	¼ miles (2,000 trees)	All successful.
Phillour ... (medium 34 inches		Ditto 57½ ...	30½	7 do. do.	7 ditto ...	4½	Do. do. New work partially so.
Nawashahr ... (dry 27 inches)		Ditto 27½ ...	5	21½ do. do.	9 ditto ...	1 mile ...	The 'plum" trees spoken of I presume to be "*bér.*"
				Groves and Plantations.			
				(*see* Narrative Note also).			
Phillour ...		Village plantations at Gulábwala and Saif-a-bád.	...	acres ?	1,600 trees	...	
Nawashahr ...		Camping ground ...	...	acres ? ...	285 trees ...	...	
...		Village plantations at Hasaripur and Patiála.	...	acres ? ...	679 trees ...	...	Including date palms.
				LUDHIANA DISTRICT.			
				Roads:			
Ludhiána ...	1	Length of road undertaken 42 miles.	7½ miles ...	miles ? requiring to be replenished ?	miles ? blanks filled with 669 trees		
Jagraon ...	2	Ditto 30 miles	14 miles ...		miles ?	1 mile ? ...	The one mile was planted with bór trees. It is impossible to know from the District Statement whether the miles gone over during the year had *all* blanks filled and were done with or only partly so.
Samrála ...	3	Ditto 9 „	?	miles ? ...	miles ? 100 trees	...	
				Groves and Plantations.			
...		Sarai Lashkari Khan ...	...	?	200 trees planted	...	Apparently added to a *previously existing* grove of some kind.
				KARNAL DISTRICT.			
				Roads.			
Karnál ... (dry 24·3 inches)	1	Total length of the road undertaken 80½ miles.	42½ miles ...	miles ? still requiring blanks to be filled up.	29 miles blanks filled.	1 mile with 220 trees.	In the District Statement the columns give no *figures*, but each contains a narrative description ; hence it is very doubtful whether the *figures* here extracted are correct. On roads we only care to deal with length, which are either *complete*, partly complete, or wholly unplanted.
Pánipat ... (dry 24·2 inches.)	2	Ditto 42 miles	27 miles ...	miles ? ditto	5 miles ditto (with 1,085 trees.)	11 miles (but 6 failed.)	
Kaithal ... (dry 22·4 inches.)	3	Ditto 64 miles	58 miles ...	6 miles ditto	„	17 miles, but 15 failed.	
				Groves and Plantations.			

(None apparently, nurseries for supply of young plants are noticed in the Narrative.)

Arboriculture Statement of the Punjab District for the year 1878-79—Continued.

Tahsil	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
		GURGAON DISTRICT.—*Roads.*					
Gurgaon ... (dry 26½ inches).	1	Length of road undertaken 33 miles.	8½	19½ with blanks here and there to be filled.	8½ miles; blanks filled.	...	3½ miles of this failed.
Nuh ... (dry 18½ inches).	2	Ditto 21 miles	16	5 ditto	...	...	Old work maintained.
Ferozepore (dry 16½ inches)	3	Ditto 14 miles	9	5 ditto	...	...	Ditto ditto.
Palwal ... (dry 18 inches).	4	Ditto 17 miles	9	8 ditto	7 miles ditto	...	Success only partial on 6 miles.
		Groves and plantations.					
Gurgaon ...		Jhursa Bund ...	...	...	280 trees	...	75 failed.
Nuh ...		Taora Pohir Rest House ...	...	...	2,000 „	...	
Ferozepore ...		Committee House ...	...	...	680 „	...	
Palwal ...		Plot at Tahsil ...	...	...	1,645 „	...	*Besides* this 655 were planted and failed.
...		On 3 encamping grounds...	...	...	415 „	...	
		[*Nurseries* intended only to produce young trees which are to be *taken away* to groves, avenues, &c., are not either groves or plantations: they are not permanent, or if they are, the trees are always being removed and renewed in the state of seedlings].					
		DELHI DISTRICT.—*Roads.*					
Delhi (Rain-fall ?)	1	Total length undertaken in year, 36¾ miles	29 miles ...	? miles ...	23 miles; blanks filled but nearly all failed.	1 mile with 450 trees	New work succeeded; the replenishing nearly all failed.
Ballabgarh .. (?)	2	Ditto 46 miles	42 miles ...	4 miles with blanks requiring to be filled	33 miles replenishing blanks.	...	Replenishing nearly all failed.
Sonepat ...	3	Ditto 28½ miles	15½ miles ...	13 miles ditto ...	12 miles ditto ...	...	All failed but ½ a mile.

			Groves and Plantations.				
Delhi ...	...	School-house at Nagloi, Jatan.	...	...	50 trees ...	...	Successful.
...		Mubárik Bágh ...	...	...	1 biga ...	...	4,700 trees successful.
Ballabgarh ...	...	Fort compound ...	...	...	...	1,400 trees ...	Successful
			HISSAR DISTRICT.				
			Roads.				
Hissar Tahsíl ... ("arid" rainfall ?)	1	Length of road undertaken yearly 41 miles.	11 miles ...	30 miles with blanks requiring to be filled.	20 miles *	...	* Nearly all failed.
Hánsi ... (?)	2	Ditto 109 ...	94½ „ ...	14½ ditto ...	8 miles with 758 trees.	...	Only partially successful.
Bhawáni ... (?)	3	Ditto 7 ...	6½ „ ...	½ ditto ...	½ mile with 302 trees.	...	Successful.
Fatahabad ... (?)	4	Ditto 28 ...	26 „ ...	2 ditto ...	1 mile with 694 trees.	...	Partially successful.
Bherwala ... (?)	5	Ditto 39 ...	36¾ „ ...	2¼ ditto ...	2 miles (failed) ...		
			Groves and Plantations.				
Hissar ...		...	...	...	(*see* Narative Report para. 116.		
			ROHTAK DISTRICT.				
			Roads.				
Rohták ... (dry 21 inches).		Ditto 60½ ...	40¾ miles ...	14 miles (?) with blanks to be filled.	10 miles replenished.	1 mile with 650 trees.	Work mostly successful.
Sampla ... (dry 22 inches).		Ditto 55½ ...	42½ „ ...	10 miles do.	10 ditto ...	1 mile with 412 trees.	Ditto ditto.
Gohana ... (dry 23 inches).		Ditto 56 ...	29 „ ...	27 „ do.	27 ditto ...	...	Mostly successful.
Jhajjar ... (dry 20 inches).		Ditto 65 ...	48¾ „ ...	4 „ do.	4 ditto ...	7 miles do.	Both "replenishment" and new work were only partly successful.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Concluded.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted but failed altogether.	4 Work of previous year which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
			Groves and Plantations.				
			(None reported.)				
			Sirsa District.				
			Roads.				
Sirsa ... (dry 23·4 inches).	1	Length of road undertaken yearly 54 miles.	49 miles ...	5 miles having blanks to be filled up.	4½ replenished ...	1 mile with 41 trees.	With partial success.
Dabwala ... (dry 17·4).	2	Ditto 44 ...	14 miles ...	30 ditto ...	Ditto ...	...	No avenues, but groves at intervals.
Fazilka ... (dry 17·8 inches).	3	Ditto 46 ...	...	46 ditto ...	miles ? replenished with 115 trees.	...	Out of the replenishments about half died.
			Groves and Plantations.				
Sirsa ...	1	Dhanni ...	...	1 acre ...	700 trees ...	...	Of which 200 died.
		Sirsa ...	...	1 acre 25 poles...	...	...	No new work done.
		Various villages ...	...	506 trees previously.	259 trees ...	...	To fill gaps (50 of these died).
Dabwalla ...	2	Plots at villages ...	...	100 trees do.	200 „ ...	...	